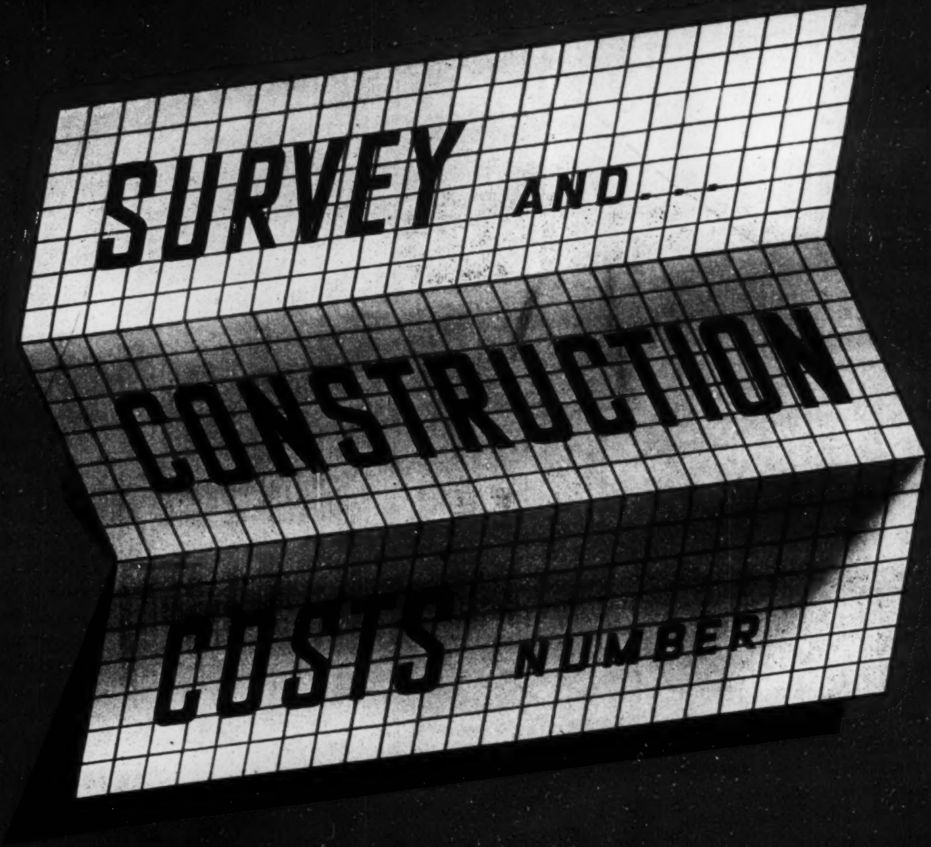
ENGINEERING
NEWS-RECORD

MARCH 17, 1949

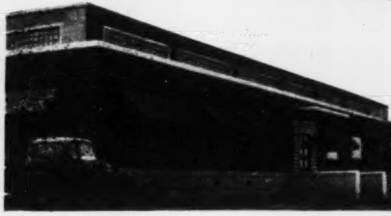


SURVEY AND . . . CONSTRUCTION COSTS NUMBER

Review of Engineering Developments • Construction Facts and Figures
Status of Major Projects • Annual Construction Costs Summary

This plant gives maintenance a cold reception with

BYERS WROUGHT IRON PIPE



Eight to ten million pounds of food, drawn from growing areas from Virginia to Florida, will flow through the Skyland Processing Corporation plant at Henderson, N.C., this year. The two-story, 220 x 222-foot building has 120,000 cubic feet of cold storage area, 100,000 cubic feet of apple storage, and 400,000 cubic feet of processing area, where asparagus, broccoli, strawberries, green beans, peaches, apples, cauliflower, and brussel sprouts are quick-frozen.

The responsibility resting on the 186-ton capacity refrigeration system is obvious; operations must be continuous, and there is no leeway for shut-downs. With the aim of assuring maximum durability and dependability, Byers Wrought Iron pipe was extensively used by the contractor, Burge Ice Machine Company. Illustrations show applications in the compressor piping, and in the cooling coils.

The soundness of these specifications is confirmed by the record, for wrought iron has made history in similar applications. One concern rebuilt its plant, and found the 22 year old wrought iron direct expansion coils in such good condition that the pipe was re-used. Nineteen years later (after 41 years of total service) inspection showed the pipe still in excellent condition. Another concern reported its 45 year old wrought iron coils still serving. These are only two examples out of many.

The unusual service qualities of Byers Wrought Iron pipe come from the unique character of the material. Tiny fibers of glass-like silicate slag, threaded through the high-purity iron, halt and diffuse corrosive attack. The fibers also anchor the initial protective scale, which shields the underlying metal.

If you have any cooling installations in mind, ask for "WROUGHT IRON IN REFRIGERATION AND AIR CONDITIONING SYSTEMS." It will give you the full story.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

BUY and SPECIFY
GOODYEAR
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SURE-GRIP—in grader and earth-mover sizes for maximum traction on drive wheels.

More grip for Graders

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JUST look at that o-p-e-n c-e-n-t-e-r self-cleaning tread and those massive lug bars and you'll see why Goodyear Sure-Grips deliver more traction than other off-the-road tires.

These husky job specialists are first choice with construction men. They give maximum grip, minimum slip—provide super pulling power—low-cost, long-life performance. Another reason why year after year, *more yards are moved on Goodyear off-the-road tires than on any other kind.*

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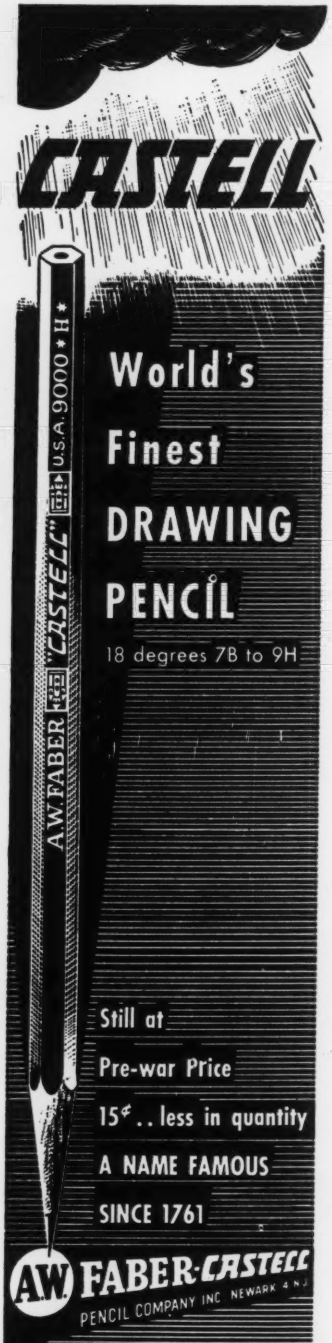
GOODYEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND



ENGINEERING NEWS-RECORD

VOLUME 142 MARCH 17, 1949 NO. 11

WALDO G. BOWMAN
Editor

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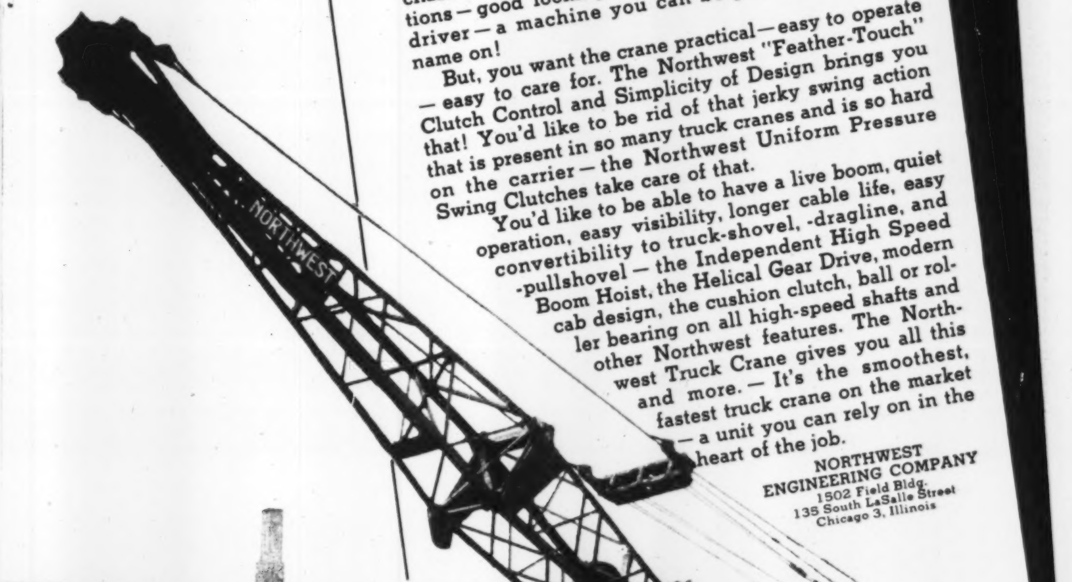

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MAJOR credit for the virtual wiping-out of the typhoid fever scourge of 50 years ago is due to the growth and progress of public water works systems. In 1899, when our Company was established, there were about 3,000 public water works systems in America. Today, 12,000 water works furnish 85 million people with eight billion gallons of water per day, 90 per cent of which requires and receives treatment to make it safe.

The gas industry and sanitation have also made notable contributions to better health and living in the past 50 years. Today, over 20 million families use gas for cooking, refrigeration, or home heating. More than half of our urban population is now served by 6,000 sewage treatment plants.

As the largest producer of cast iron pressure pipe for water, gas and sewerage service, we too can look back on a half-century of progress in manufacturing methods, production standards, quality controls and facilities for research and development. The service records of our early product are truly remarkable, yet U. S. Cast Iron Pipe as we make it today is demonstrably superior—in strength, in toughness and in uniformity.

To those responsible for the great progress in water supply, gas and sanitation service and their contribution to better health and living over the past fifty years, America pays tribute

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CAST IRON
PIPE

1899-1949
U. S. Pipe & Foundry Co.
Makers for 50 years of cast iron pipe for water, gas and sewerage service. General Offices: Burlington, N. J.

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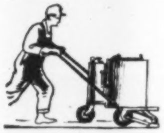
JOIN UP WITH Flintseal
AND SAVE TIME, MONEY, AND TROUBLE!



Here's a friend that sticks! Through fair weather and foul. Under all kinds of conditions.

This rubber-bearing, thermoplastic compound seals joints smoothly, neatly, *positively*...and far outlasts old-fashioned materials.

1) Special equipment enables you to melt and pour Flintseal* quickly, safely, economically...and gives you a neat, smooth-riding joint.

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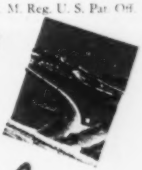
3) Flintseal stays resilient. It won't become brittle and crack in coldest weather, nor will it flow on hottest days.

4) Because of this *lasting* resilience and adhesion, Flintseal maintains a tight joint throughout repeated cycles of expansion and contraction of the slabs.

Exceptionally satisfactory for sealing joints and cracks in concrete, Flintseal is finding wide use on municipal pavements, highways, airport runways and many smaller jobs in swimming pools, roofs, platforms and the like.

Get complete information on how joining up with Flintseal can save *you* time, money and trouble...by giving you a fast neat job, and cutting maintenance costs to the bone. Write today for your copy of the free folder illustrated.

*T. M. Reg. U. S. Pat. Off.



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For tough going — and tight squeezes — TRAXCAVATORS are compact, built close to the ground and handle fast and easy. Ideal for tight congested areas. There's also a size for every job and purpose. See your nearest TRACKSON-"Caterpillar" dealer or write direct to TRACKSON COMPANY, Dept. EN-39, Milwaukee 1, Wisconsin.

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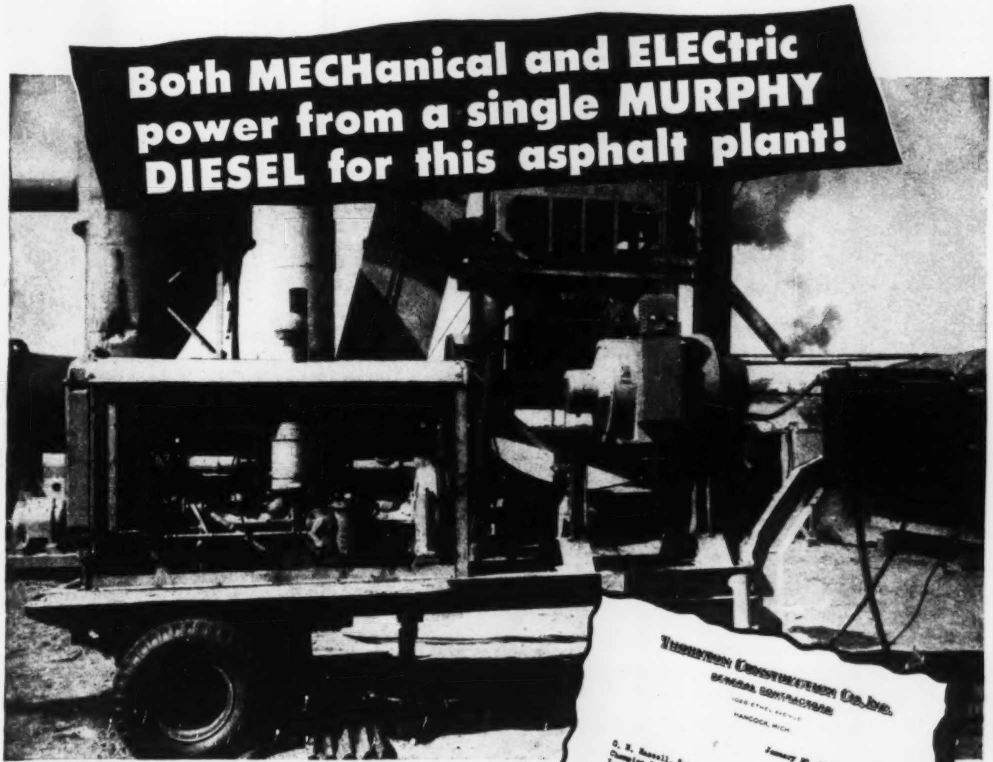
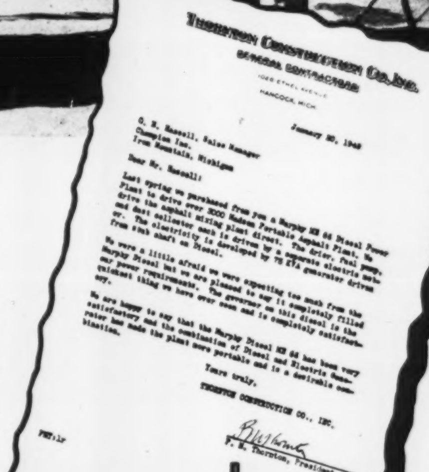
THE ORIGINAL TRACTOR EXCAVATOR

Both MECHanical and ELECtric power from a single MURPHY DIESEL for this asphalt plant!





THORNTON CONSTRUCTION CO. INC.
GENERAL CONTRACTORS
1020 ETHEL AVENUE
HANCOCK, MICH.

January 20, 1949

G. E. Hassell, Sales Manager
Champion Inc.
Iron Mountain, Michigan

Dear Mr. Hassell:

Last spring we purchased from you a Murphy ME 66 Diesel Power Plant to drive over 3000 Madsen Portable Asphalt Plant. We drive the asphalt mixing plant direct. The drier, fuel pump, and dust collector each is driven by a separate electric motor. The electricity is developed by 75 KVA generator driven from stub shaft on Diesel.

We were a little afraid we were expecting too much from the Murphy Diesel but we are pleased to say it completely filled our power requirements. The governor on this diesel is the quickest thing we have ever seen and is completely satisfactory.

We are happy to say that the Murphy Diesel ME 66 has been very satisfactory and the combination of Diesel and Electric Generator has made the plant more portable and is a desirable combination.

Yours truly,

THORNTON CONSTRUCTION CO., INC.

F. H. Thornton, President

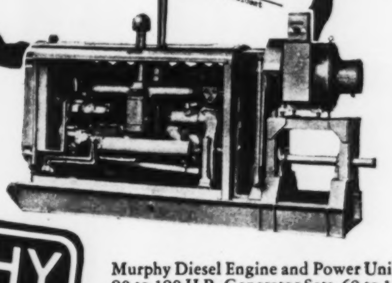
FHT:lr

MURPHY DIESEL MECH-ELEC UNITS PROVIDE A COMPLETE POWER PACKAGE

FOR jobs where the advantages of a mechanical drive are necessary for the major load, but the flexibility of electrical power is desirable for secondary loads, Murphy Diesel now offers the MECH-ELEC Unit. A complete, packaged power plant, it is capable of delivering varying proportions of mechanical and electric power *simultaneously.* Electric power as required, up to 50 K.W., may be taken from the generator while the remaining unused portion of the engine's full rated power can be taken off the shaft mechanically. The generator can be operated without engaging the mechanical drive.

Two MECH-ELEC models are now available: The Model ME-6, rated at 135 H.P. continuous, 160 H.P. intermittent; and the Model ME-66, rated at 150 H.P. continuous, 180 H.P. intermittent. Both are equipped with 50 K.W. generators. The ratings indicate the total mechanical power available.

Ask your Murphy Diesel Dealer for full information or write direct.



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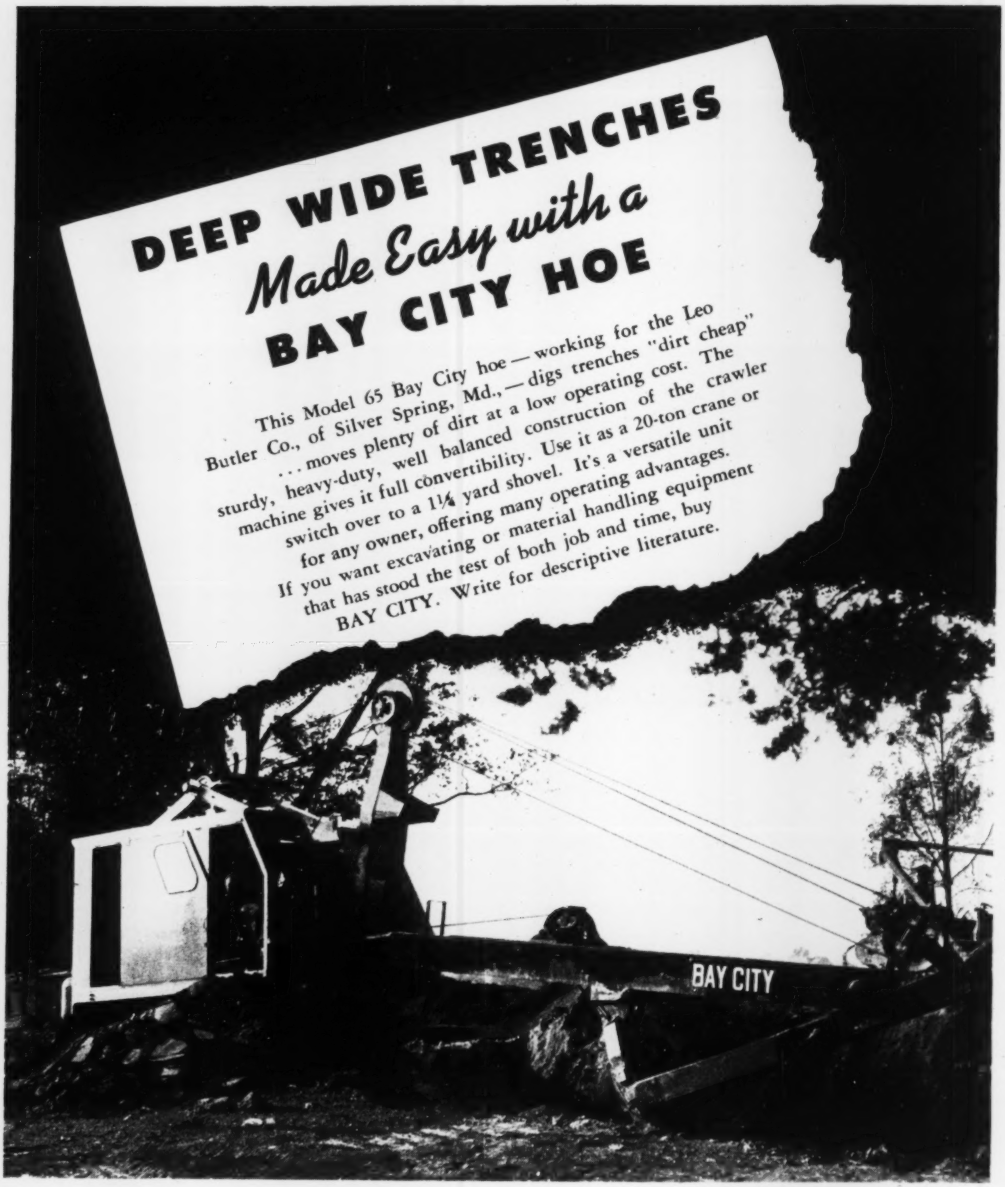
MURPHY DIESEL

Murphy Diesel Engine and Power Units, 90 to 190 H.P. Generator Sets, 60 to 116 K.W. Combination MECHanical and ELECtric Power Units, 135 to 180 H.P.



DEEP WIDE TRENCHES *Made Easy with a* BAY CITY HOE

This Model 65 Bay City hoe — working for the Leo Butler Co., of Silver Spring, Md., — digs trenches "dirt cheap" . . . moves plenty of dirt at a low operating cost. The sturdy, heavy-duty, well balanced construction of the crawler machine gives it full convertibility. Use it as a 20-ton crane or switch over to a 1¼ yard shovel. It's a versatile unit for any owner, offering many operating advantages. If you want excavating or material handling equipment that has stood the test of both job and time, buy BAY CITY. Write for descriptive literature.

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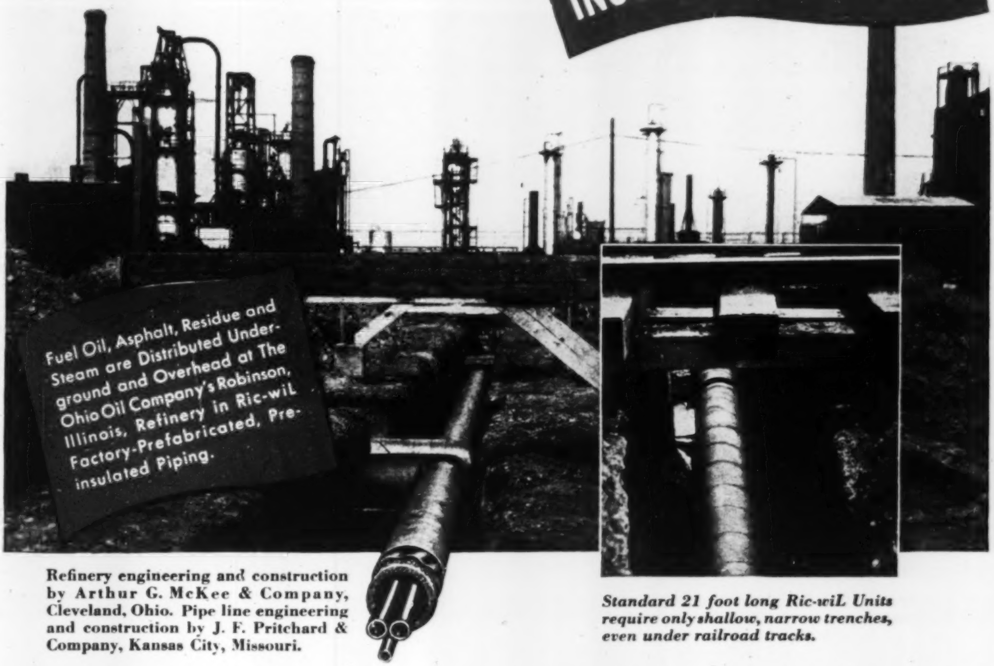
BAY CITY SHOVELS INC., BAY CITY, MICHIGAN See your nearest Bay City dealer for excavating and material handling equipment in sizes from ⅜ to 1¼ yard with crane rating up to 20 tons. Both crawler and pneumatic tire mountings.

Oil Refinery Meets Diversified Piping Needs with RIC-WIL INSULATED PIPE UNITS


Fuel Oil, Asphalt, Residue and Steam are Distributed Underground and Overhead at The Ohio Oil Company's Robinson, Illinois, Refinery in Ric-wiL Factory-Prefabricated, Pre-insulated Piping.

Refinery engineering and construction by Arthur G. McKee & Company, Cleveland, Ohio. Pipe line engineering and construction by J. F. Pritchard & Company, Kansas City, Missouri.

Standard 21 foot long Ric-wiL Units require only shallow, narrow trenches, even under railroad tracks.

● The adaptability of Ric-wiL Insulated Piping Systems to any type of piping requirement is ably demonstrated by this refinery installation. It consists of ten separate runs of prefabricated pipe units employing a wide variety of pipe sizes and pipe arrangements for distribution of steam and viscous fluids at various temperatures.

The temperatures required for the distribution of the various viscous fluids are efficiently maintained in Ric-wiL Uniline Insulated Pipe Units. In this type of construction, pipes carrying oil, asphalt, etc., are nested with a steam tracer inside an insulation liner which insulates them from the exterior but not from each other.

At Ohio Oil, many different viscous fluids are carried in 4″ and 6″ pipes at temperatures ranging from 125° to 400°F. Steam for tracer lines and processing is distributed in pipes of from 1″ to 6″ diameter at 150 psi, 450°F.

Pipes and insulation are housed in helically corrugated, 16 gauge galvanized ingot iron Hel-coR conduit, ranging from 8″ to 21″ in diameter. The inherent flexibility and strength of this conduit permits underground installation with only 3′-5′ cover, even under heaviest ground loads. Overhead installations require a minimum of scaffolding and supporting structures. Units may be connected on ground before being lowered into trench or erected for overhead suspension. Entire piping systems are delivered completely prefabricated with all accessories—elbows, tees, anchors, expansion loops, etc.—ready for speedy, low cost installation.

Ric-wiL manufactures three basic types of Prefabricated Insulated Piping Systems—Hel-coR, Foilclad and Cast Iron Pipe Units. Pipe, insulation, and protective covering are factory-tailored to individual specifications to meet any condition or requirement for outside piping distribution. For descriptive literature, full information, write: The Ric-wiL Company, Department 12-D.

RIC-WIL

INSULATED PIPING SYSTEMS

THE RIC-WIL COMPANY • CLEVELAND, OHIO

REPRESENTATIVES IN PRINCIPAL CITIES

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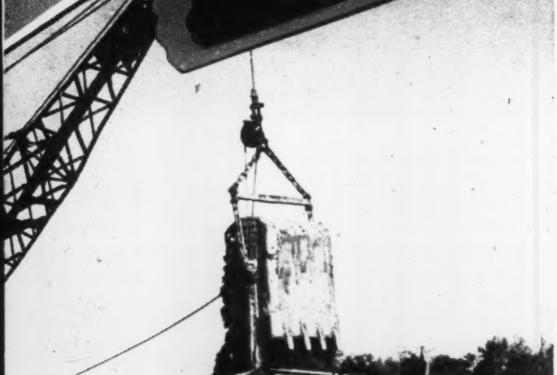
SERVICE



Bottom-Dump Euclids have payload capacities of 13 to 50 cu. yds.—20 to 40-ton payloads . . . top speeds loaded up to 32.8 m.p.h. . . . powered by 150 to 275 h.p. Diesel engines.

Thanks to factory trained personnel in Euclid distributor organizations throughout the world, Euclid users are assured prompt and efficient service.

Engineered specifically for heavy off-the-highway use, "Eucs" are first choice for open pit mining operations, quarries, large construction and industrial jobs. Down-time and maintenance costs are kept at a minimum on these operations by service specialists and readily available supplies of Euclid parts.

EUCLIDS

MEANS MORE PROFITS!

Ruggedly built with plenty of power and stamina, Euclids have proved their staying power on the tough jobs. First in performance—First in service . . . a Euclid combination that adds up to customer satisfaction.

Euclids move more payloads at less cost. Specially trained service experts are in readiness to provide service to owners when and where it is needed.

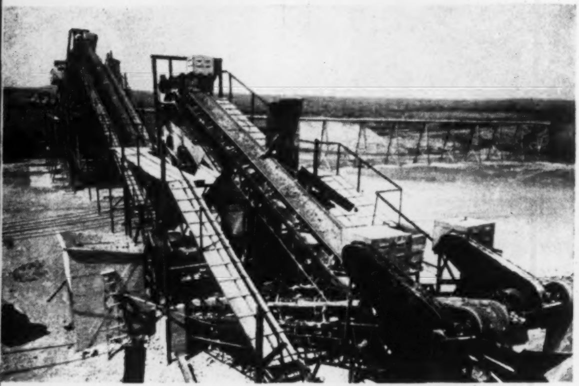
Your Euclid Distributor or Representative will be glad to go over your job requirements and show you how dependable performance day in and day out, plus speedy on-the-job service, keeps Euclids rolling and job profits up.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio

Rear-Dump Euclids, of 15 to 30-ton payload capacities, have body designs for low-cost hauling of all types of materials . . . wide range of travel speeds up to 35.4 m.p.h. . . . powered by Diesel engines up to 275 h.p. rating.

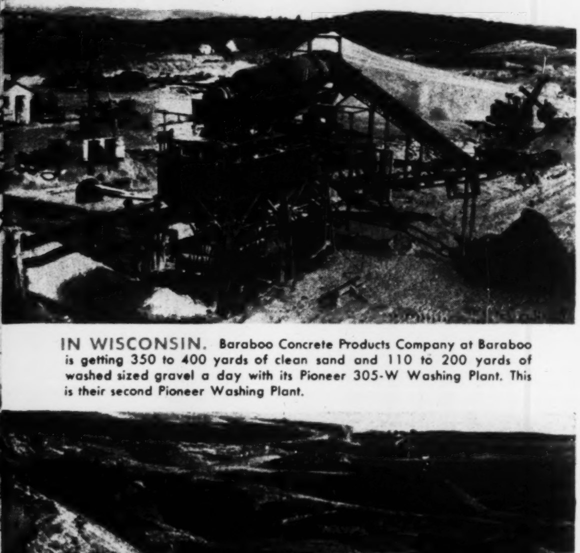
Move the Earth

Why some men make



IN TEXAS. Tom Popplewell, president of the Panhandle Gravel Co. at Amarillo, reports this Pioneer plant produces 125 yards of sized, washed material an hour. Pioneer equipment—a 1536 Jaw, a 40x22 Roll, a 4x12 Vibrating Screen, 48" Revolving Screen, 30" Feeder and Conveyors.

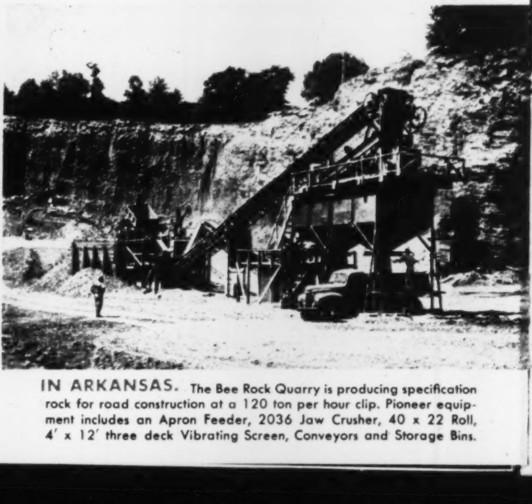
IN INDIANA. The Pipe Creek Stone Company located just outside of Sweetzer produced 100-125 tons of rock an hour with its Pioneer plant. A new Pioneer Jaw Crusher recently installed will reduce oversize . . . help produce more "pay" material.



IN WISCONSIN. Baraboo Concrete Products Company at Baraboo is getting 350 to 400 yards of clean sand and 110 to 200 yards of washed sized gravel a day with its Pioneer 305-W Washing Plant. This is their second Pioneer Washing Plant.

IN TENNESSEE. In seven months Charlie Langford's Pioneer plant at Cookeville produced over 250,000 tons of road aggregate and ag-lime. His other Pioneer plant located at Gallatin has produced over a quarter-million tons of aggregate and ag-lime in one year.

IN CALIFORNIA. Livingston Truck and Materials Co., near San Pedro, produces 300 tons of 1" minus granite an hour. Included in this big plant is a Pioneer 54 x 24 Roll Crusher, a 40 x 22 Roll Crusher, and a Pioneer 3042 Jaw Crusher.



IN ARKANSAS. The Bee Rock Quarry is producing specification rock for road construction at a 120 ton per hour clip. Pioneer equipment includes an Apron Feeder, 2036 Jaw Crusher, 40 x 22 Roll, 4' x 12' three deck Vibrating Screen, Conveyors and Storage Bins.

more money than others

IN OKLAHOMA. Mittry Brothers supply the big Hulah Dam Project with four sizes of washed specification material and sand. Pioneer Equipment includes an Apron Feeder, Jaw Crusher, Vibrating Screens, Triple Roll Crusher, Dehydrator, Bucket Elevator, Revolving Scrubber, and Storage Bins. Of course, all Conveyors were furnished by Pioneer.

BEHIND each one of these gravel and quarry plants, there's a very successful man . . . a man who has to be shown before he buys equipment.

In this space, we can show only seven such plants, owned by seven such men. But there are scores of others —in every part of the United States, in Mexico, Brazil, South Africa, Greece, the Philippines . . . all over the globe.

Why has PIONEER equipment won this world-wide acceptance and the "repeat orders" which prove its performance on the job? Because it *delivers.* PIONEER equipment is rugged, dependable, engineered for high production with minimum upkeep. That's why so many PIONEER plants dot the landscape.

As the leading designers and manufacturers of stationary quarry, gravel and washing plants, PIONEER engineers are extremely well qualified by years of experience to help you meet competition . . . produce material at the lowest possible cost.

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● Please send me information on the products checked below:

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☐ Washing plants
☐ Conveyors
☐ Feeders
☐ Jaw Crushers
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☐ Vibrating Screens

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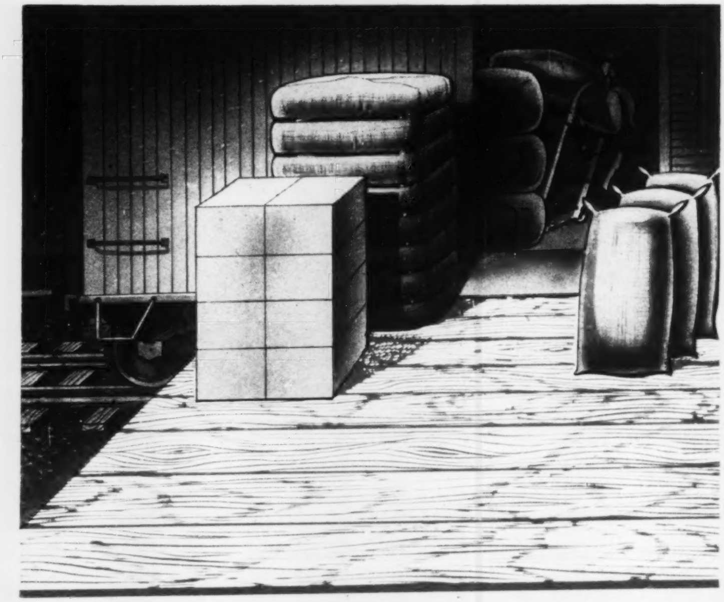
*City*____________________ *State*__________



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- Rafters and Roofing
- Sash and Doors
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PENTA CHLOROPHENOL preservative

(Monsanto's Santophen 20)

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Wood properly treated with Penta is CLEAN and STAYS CLEAN. It resists leaching even under conditions of high humidity or moisture; is paintable when formulated with suitable carrier oils. This non-bleeding quality of Penta is especially important where people or packaged goods come in contact with wood...It will not stain; has no objectionable odor.

Penta's high toxic value assures years of dependable protection against exposure, wood-rotting fungi, termites and other wood-boring insects. This toxicity never varies, since the chemical characteristics of Penta are always constant, always laboratory-controlled.

The Penta treatment, by either pressure or open tank method, is simple. To learn more about its advantages, send for your copy of a new Monsanto folder, "Monsanto Pentachlorophenol for Preserving Wood in Industrial Construction." Address MONSANTO CHEMICAL COMPANY, Desk C, Organic Chemicals Division, 1759 South Second Street, St. Louis 4, Missouri.

Santophen: Reg. U. S. Pat. Off.

MONSANTO CHEMICAL COMPANY
Desk C, Organic Chemicals Division
1759 South Second Street, St. Louis 4, Missouri

Please send me a copy of your folder on Penta for Industrial Construction.

Name ________________ Title ________________
Company ________________
Address ________________
City ________________ State ________________

SERVING INDUSTRY...WHICH SERVES MANKIND

MONSANTO
CHEMICALS AND PLASTICS

MARMON-HERRINGTON

All·Wheel·Drive

Big Trucks—and Small for Every Tough Job Call

In the Marmon-Herrington line you will find an *All-Wheel-Drive* truck—*with the right power, in the right capacity*—to fit every tough trucking job exactly, however big or small.

Marmon-Herrington offers twenty-two *All-Wheel-Drive* models in all. Four are heavy-duty models of the company's own manufacture; the balance are standard Ford models converted to *All-Wheel-Drive* by Marmon-Herrington. Wheelbases range from 110 inches to 220 inches—gross vehicle weights from 5,300 pounds to 42,000 pounds. There are 7 great engines, Diesel and gasoline—from 4 to 10 forward speeds, 1 to 4 reverse.

Live power and traction in all wheels—*front wheels pulling, rear wheels pushing*—give Marmon-Herringtons tremendous tractive power for toughest off-the-road operations . . . no mud too deep, no hill too steep, no going too rough and rugged. Let your Marmon-Herrington dealer give you an on-the-job demonstration of these great *All-Wheel-Drive* trucks. You'll witness an eye-opening brand of performance-ability.

MARMON-HERRINGTON COMPANY, INC. • INDIANAPOLIS 7, INDIANA

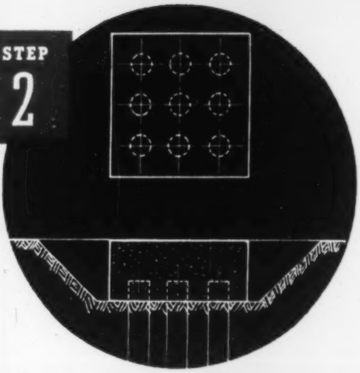
MARMON-HERRINGTON

All·Wheel·Drive

STEP 1

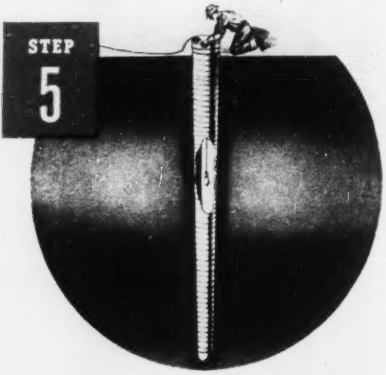
SUBSOIL INVESTIGATIONS... Raymond's exploratory soil borings provide engineers with reliable data for determining the best and most economical foundation design.

STEP 2



SPECIALIZED ENGINEERING ASSISTANCE... When requested, Raymond's highly trained and experienced engineering staff helps you to solve your foundation problems.

STEP 5



TIP-TO-TOP INTERNAL INSPECTION . . . After driving, the core is removed and the pile-shell is thoroughly inspected to assure a satisfactory form, free from water, mud or other materials.

STEP 6

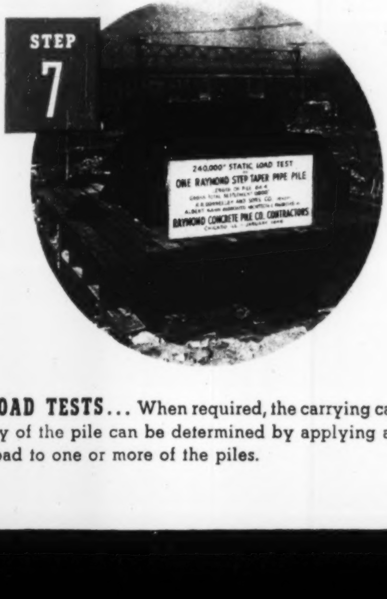
FILLING PILE-SHELLS WITH CONCRETE... Raymond piles are completed by filling the shells with concrete. The shells protect the wet concrete, thereby assuring perfect piles.

8 steps of Raymond service

These are the eight steps that comprise the tested and proved Raymond service – a service designed to meet your foundation requirements at minimum cost. No matter how large or how small your job may be, these eight steps are your assurance of the thoroughly dependable workmanship for which Raymond is internationally known. Your inquiry is cordially invited.

ASSEMBLING EQUIPMENT . . . The appropriate Raymond-built equipment located nearest the job is quickly assembled. Specialized equipment means efficient service.

DRIVING THE PILE . . . Raymond rigs drive each pile to the specified resistance. Soil pressures developed during driving are fully maintained.


STEP
7
240,000# STATIC LOAD TEST
ONE RAYMOND STEP TAPER PIPE PILE
RAYMOND CONCRETE PILE CO. CONTRACTORS

LOAD TESTS . . . When required, the carrying capacity of the pile can be determined by applying a test load to one or more of the piles.

COMPLETED PILE FOUNDATION . . . A Raymond concrete pile foundation is permanent – with bearing capacity uniform and well in excess of specified requirements.

RAYMOND

SCOPE OF RAYMOND'S ACTIVITIES

includes every recognized type of foundation construction – concrete, composite, precast, steel, pipe and wood piles. Also caissons, underpinning, construction involving shore protection, shipbuilding facilities, harbor and river improvements, and borings for soil investigation.

52 YEARS FOUNDED 1897 OF PROGRESS

AROUND THE WORLD

NOW! SIMPLIFY EQUIPMENT MAINTENANCE

NEW Mobilube GX

HERE IT IS—One Great Gear Oil for All Axles and Manually Shifted Transmissions—Gives Top Protection Under Heavy Loads, High Speeds!

- New Mobilube GX Gear Oil (GX 80, GX 90 and GX 140) is especially made:

1. To eliminate the need for different gear lubricants for axles and manually shifted transmissions.
2. To end the danger of filling gear cases with the wrong type of lubricant.
3. To help protect gears from welding—corrosion—wear—throughout the entire range of loads and speeds.

New Mobilube GX combines the qualities of many individual gear lubricants. It affords exceptional protection for axle gears of the hypoid, spiral bevel, and double reduction types.

What's more, the same New Mobilube GX is recommended for all manually shifted transmissions, including passenger car overdrive types.

Simplify your lubrication set-up now. Get *Safe, Multi-Purpose* New Mobilube GX—qualified under U.S. Army Specification 2-105B. It will help keep machines on the job—speed work progress.

* * *

Your Socony-Vacuum Representative will be glad to give you additional information. Ask him about Socony-Vacuum's complete Contractors' Service.

WITH ONE MULTI-PURPOSE GEAR LUBRICANT!

TESTS SHOW—

New Mobilube GX Lubricants are designed to protect gears and pinions under heavy loads and high rubbing speeds—are non-corrosive, even if water gets in housing—are non-foaming—help assure freedom from deposits.

AVOID COSTLY WEAR—

Use gear lubricants that guard against friction—corrosion—sludge formation! Get New Mobilube GX.

SOCONY-VACUUM OIL COMPANY, INC.
and Affiliates: MAGNOLIA PETROLEUM CO.
GENERAL PETROLEUM CORPORATION

SOCONY-VACUUM

Contractors' Service

Keeps machines on the job...
Speeds work progress!

SOCONY-VACUUM

Hold Down Cost!

In Spite of Rising Expenses
The **ROCKMASTER** Blasting System
Stabilizes Over-All Costs!

Sounds incredible in the face of rising costs of labor and blasting supplies. But it *is* true! Quarries, mines, stripping operations and construction projects hold down over-all costs with the Rockmaster Blasting System. Here's a case in point:

One company with the tough job of blasting hard limestone figures it saves $20,000 a year through the use of Rockmaster. They do less drilling, use less equipment, and have boosted their daily tonnage by five hundred tons. What's more, they have cut vibration and noise to a minimum—of prime importance to a quarry located within city limits!

When Atlas pioneered Rockmaster, it introduced a new concept of blasting. Rockmaster is a blasting *system* based on the right explosive and method of loading . . . the proper spacing of holes . . . the selection of the right milli-second delays—all based on the kind of rock being blasted.

Call in your Atlas representative. He'll be glad to show you how Rockmaster can help *you* hold down your blasting costs.

ROCKMASTER GIVES
YOU THE GREATER
SAFETY OF MANASITE
DETONATORS

ATLAS POWDER CO.
ATLAS EXPLOSIVES

Less Bark . . .
More Bite

"ROCKMASTER"—Trade Mark
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ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • ***Offices in principal cities*** • ***Cable Address—Atpowco***

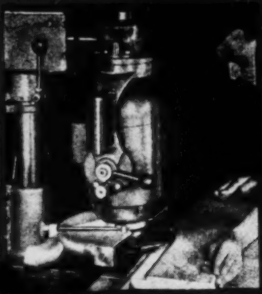
Radial SKILSAW

More sawing every hour with RADIAL SKILSaw!

Radial SKIL Saw does more in less time. There's no time lost setting-up or changing jobs. All adjustments are made quickly and easily from the front. There's no support in your way. Radial SKIL Saw operates easily . . . with finger-tip control . . . means easier, faster production on all your jobs.

And Radial SKIL Saw is built to last. The best of materials . . . top engineering . . . finest design have been incorporated into every part . . . your assurance of long-lived low cost! Call Your SKIL Tool Distributor today for a demonstration.

Straight ripping or bevel-ripping is easy with Radial SKIL Saw. The operator simply slides the material along the rip fence for accurate cuts.



Routing is another of the many cuts you can make with Radial SKIL Saw . . . and you can be sure that every cut is a precision cut every time!

SKIL
ELECTRIC
Tools
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Standard Bolts

FOR CONSTRUCTION

STANDARD BOLTS
ARE A PRODUCT OF
BETHLEHEM'S
LEBANON, PA., PLANT

ALL SIZES **ALL TYPES**

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL

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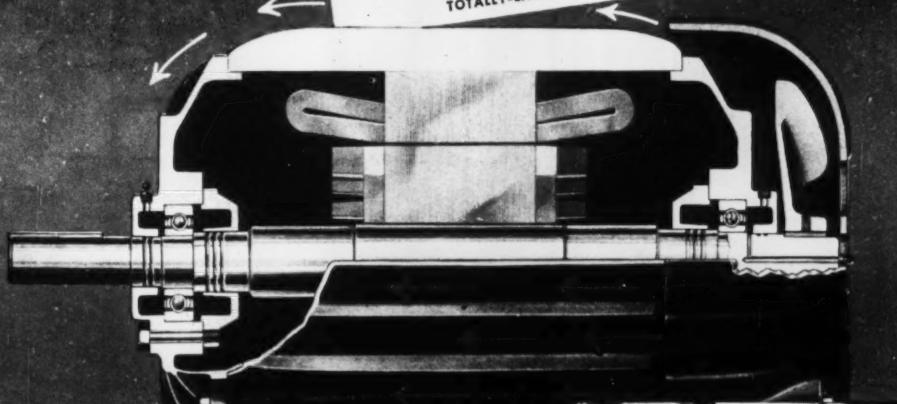
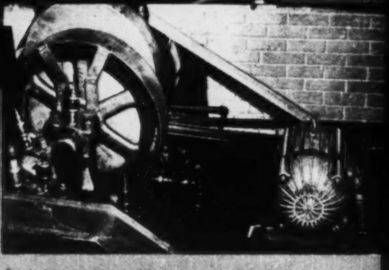
CROCKER-WHEELER *Sealedpower* **MOTOR**

TOTALLY-ENCLOSED . . . FAN-COOLED





Sealedpower Motor driving a vertical triplex power pump where moisture is excessive.

Saves 80% of Maintenance Costs

You can make maintenance savings of 80% and *more* with Crocker-Wheeler Sealedpower Motors. The secret? C-W dollar-saving design. No other totally-enclosed, fan-cooled motor has *exterior* cooling, with the fan-driven airstream blowing over a finned frame, carrying dust and fumes *outside* and *away*. (The outside fins that identify a Sealedpower Motor provide over 150% more cooling surface.)

But that's not all — this motor keeps cooler longer because it keeps cleaner. There's no place for lint or dirt to *collect* . . . nothing to hold heat *in*. Even on the really dirty jobs, a Sealedpower Motor will keep production going many times longer than "ventilating passage" motors, without a shutdown for cleaning.

For years of cool, clean operation and low maintenance cost, specify Sealedpower Motors. They're stock motors made for the toughest service. In new ratings from 3 to 60 hp.

CROCKER-WHEELER
SEALEDPOWER MOTOR

Crocker-Wheeler Electric Manufacturing Company, Ampere 3, N. J. Division of The Joshua Hendy Corp., Branch Offices: Boston, Buffalo, Chicago, Cincinnati, Cleveland, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, San Francisco, Washington, D. C. Representatives in principal cities.

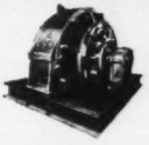
SEND FOR BOOKLET, "It's Different — it's a Dollar-Saver." Tells why the Sealedpower Motor will save money for you.

WHATEVER YOUR MOTOR REQUIREMENTS — CALL ON CROCKER-WHEELER

If Crocker-Wheeler builds it, it's a better built machine.

Horizontal and Vertical Protected-Type Induction Motors

A-C Generators and High Speed Synchronous Motors



Large D-C Motors and Generators

Turbogenerators

CROCKER WHEELER

ELECTRIC MANUFACTURING COMPANY, AMPERE 3, N. J.

Division of Joshua Hendy Corporation

POWER

Exide
BATTERIES

bring *EXTRA* power to Diesel engine cranking

When Exide Batteries do the cranking, Diesel engines start. They're proving that daily on thousands of off-the-highway operations, in all parts of the world, and under all service conditions.

Exide Batteries surpass in this toughest of all cranking tasks because they're built specifically for the job. They are a development of an engineering and manufacturing skill gained from long experience in building batteries for hundreds of applications. You can always count on Exide Diesel Cranking Batteries for dependability, long life and low cost maintenance.

1888... DEPENDABLE BATTERIES FOR 61 YEARS...1949

THE ELECTRIC STORAGE BATTERY COMPANY, *Philadelphia 32*
Exide Batteries of Canada, Limited, Toronto

DO YOU HAVE THIS FREE BOOK?

RADIANT HEATING WITH NATIONAL PIPE

It tells what you want to know about

Radiant Heating

● This 48-page book, "Radiant Heating with National Pipe" is one of the most authoritative books published on the subject. It brings you a complete, comprehensive story of radiant heating and gives helpful information as a practical basis for the planning and installing of an efficient system.

Architects, heating engineers and contractors will find the book valuable for use in planning new installations. It answers many important questions about radiant heating. For example —

What is the approximate cost of a radiant heating system?

Would it cost more or less to operate a radiant heating system than other types, and by how much?

What effect do rugs and rug pads have on heat transfer in a radiant heating system?

These and many other questions are competently answered. This book also shows you how to calculate pipe sizes for various conditions. Mail the coupon and a copy will be sent at once.

Here are some of the subjects covered:

- What is radiant heating?
- How radiant heating is designed for comfort.
- How to estimate heat losses.
- How to determine radiant heating coil requirements.
- Radiant heating comfort chart.
- What heating engineers claim for radiant heating.
- Methods of floor and ceiling installation.
- Typical pipe coil patterns.
- Questions and answers on radiant heating.
- Heat transmission tables.

National Tube Company
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Gentlemen:

Please send me a copy of your FREE book, "Radiant Heating with National Pipe."

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NATIONAL TUBE COMPANY, PITTSBURGH, PA.
COLUMBIA STEEL COMPANY, SAN FRANCISCO,
PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

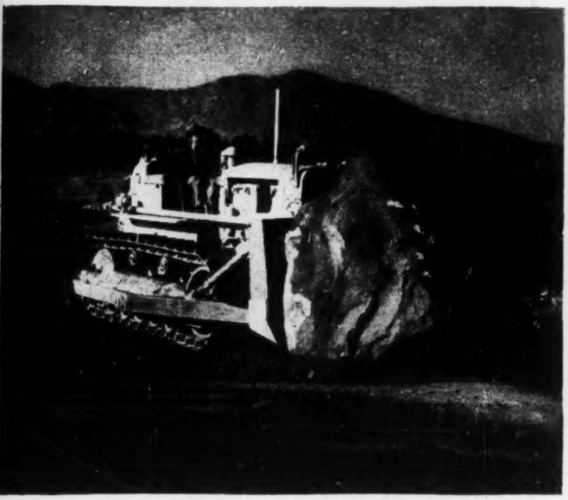
USS

NATIONAL Steel PIPE

UNITED STATES STEEL

Changing the channel of the Yakima River, near Ellensburg, Wash., this "Caterpillar" Diesel D7, with No. 7S Bulldozer, works in 3 feet of water, doing a difficult job with ease.

On a highway job near Hampshire, Tenn., this "Caterpillar" Diesel D8 Tractor with No. 8S Bulldozer operated at 1½c per yard lower maintenance cost than a competitive tractor.



A "Caterpillar" Diesel D7 and No. 7S Bulldozer clearing rocky land for a citrus grove, Santa Paula, Calif. Operator says: "This is the neatest operating 'dozer I've ever worked with."

A "Caterpillar" Diesel D6 Tractor with No. 6A angling-type Bulldozer, is shown here building dike for a big new irrigation system in the Rio Grande Valley near Eagle Pass, Texas.

Top-Dog in the

Three years ago the "Caterpillar" Bulldozer entered the earthmoving picture. Since then thousands of contractors have used it on their jobs—proved its toughness—checked its big yardage and low operating costs. From coast to coast they talk about its ease of adjustment, its freedom from overhead structures, and the excellent rolling action that's built into the blade. Today, more than ever, this rugged unit is hailed everywhere as Boss of the Bulldozers.

Designed and engineered as perfect teammates for the power of "Caterpillar" Diesel Tractors, "Caterpillar" Bulldozers are now available in a complete line of both cable-controlled and hydraulic-controlled units. See your "Caterpillar" dealer for full particulars. He can also supply you with information on how these revolutionary 'dozers can be used with tractors of other makes.

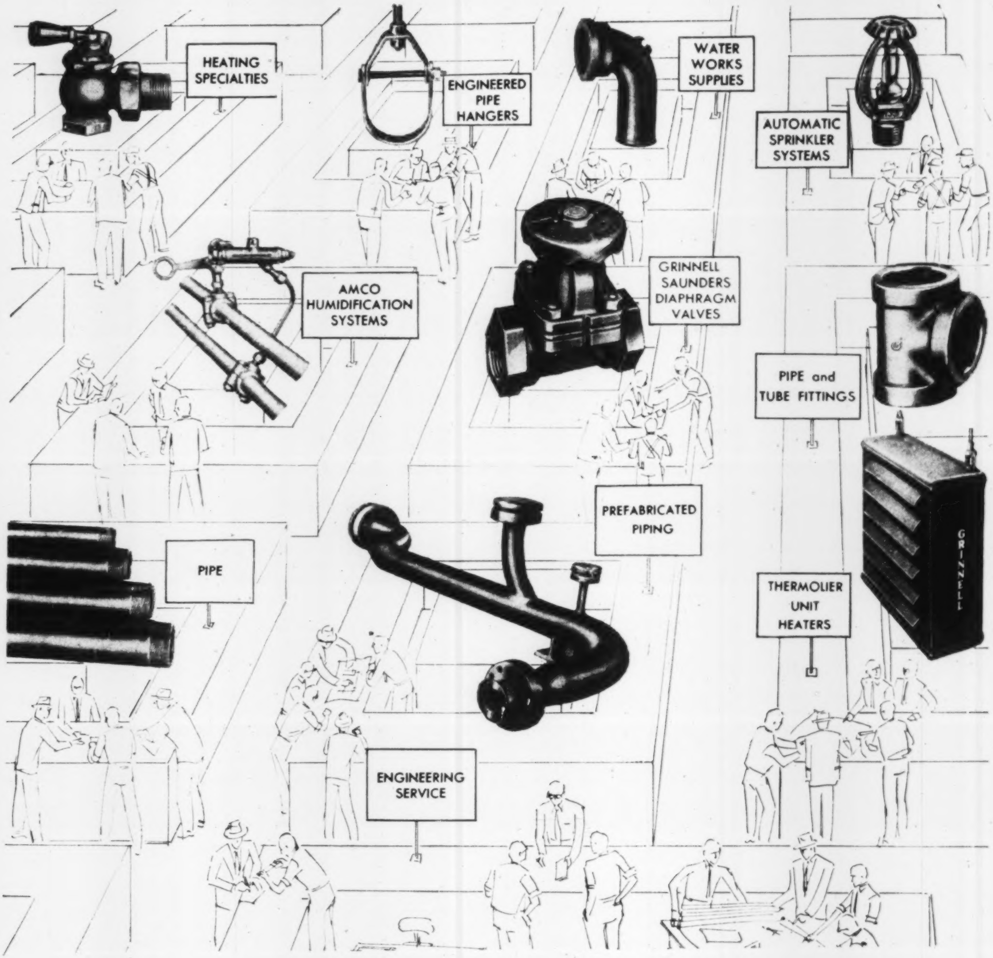
CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

'Dozer field

This "Caterpillar" Diesel D8 Tractor with No. 8S Bulldozer handles 6000 to 8000 tons of sand and gravel daily at the Henry J. Kaiser plant, Pleasanton, Calif. Supt. B. F. Carter says: " 'Caterpillar' equipment stands up better and does a better job. Wouldn't have anything else."

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL

ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT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EVERYTHING FOR PIPING UNDER ONE ROOF

Shop for piping the easy way — call Grinnell. At each Grinnell warehouse a staff of experienced piping specialists is ready to help you with engineering assistance. Save time, save money, save the trouble of shopping around. Make a Grinnell warehouse your service center for everything in piping from a simple water connection to a 1500 lb. steam pressure line. No job too small, no job too large. Remember to call on Grinnell "whenever PIPING is involved".

99 YEARS
WHENEVER PIPING IS INVOLVED

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IT'S P&H FOR ADDED VALUES!

WHERE "Swing Time" IS PAY-OFF TIME!

Yes, faster swing is the big pay-off when you operate a P&H Model 1055. Its *"Magnetorque" Electric Swing unit is 20% faster — delivers 5 cycles to 4 on other machines. It means more productivity — extra yardage that adds up fast.

It's smoother too — with velvety stops and starts that protect machinery against damaging wear. Simple, effortless control gives this big 2½ yard machine the easy operation that you normally associate with much smaller machines.

The best way to gain a comparison is to watch a P&H 1055 on the job. Drop us a line . . . ask for location of the one nearest you.

*THE P&H MAGNETORQUE transmits power for swing electro-magnetically. It does away with all frictions on swing and propel — eliminates the usual time-outs for adjustments. The P&H Magnetorque lasts the life of the machine.

P&H EXCAVATORS
4490 W. National Avenue
Milwaukee 14, Wis.

HARNISCHFEGER
[illegible]

On mountain-top mine, rubber strips 25,000 yards

It takes the agility of a mountain goat to set foot on Garfield Chemical Company's new phosphate mine at Diamond Fork Canyon, near Springville, Utah. Here, located at 8,000' altitude, a rubber-tired C Tournadozer climbed along steep, rock-faced slopes . . . shoved 25,000 yards off the mountain top in thirty-five 8-hour shifts.

8' Overburden Dozed an average of 175'

Overburden consisted of an 8-foot layer of heavy clay and imbedded boulders . . . last 18 inches above phosphate was an even tougher, semi-solid material. The entire 25,000 yards had to be moved an average distance of 175 feet. By handling all stripping in 281 work-hours, Tournadozer maintained an overall job average of 89 bank yards an hour. This checks with a time study on a 209-foot one-way shove, which showed the Tournadozer moved 76 bank yards an hour.

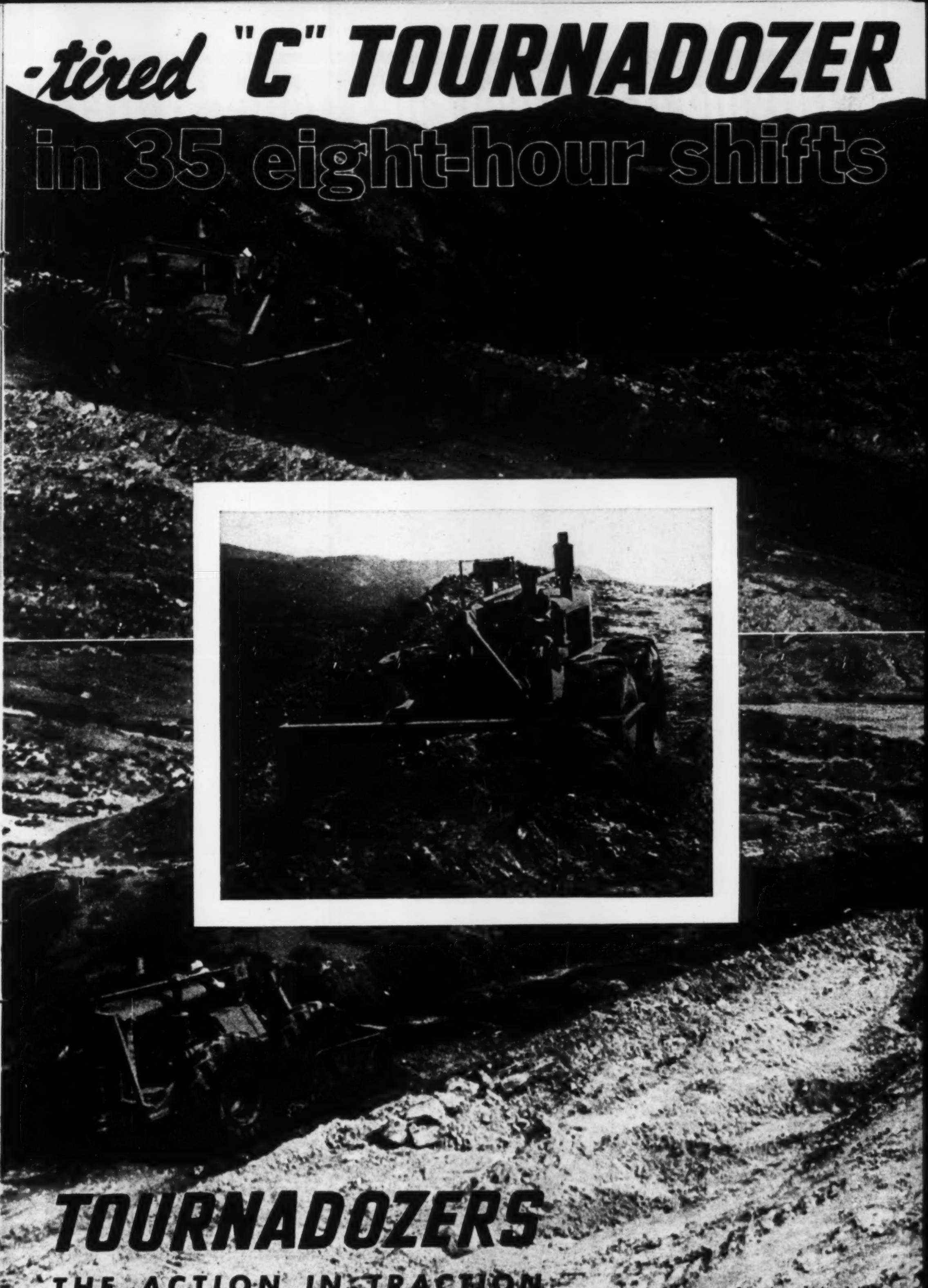
Dozed 2½ to 3 yds. each pass

On this work, Tournadozer's 180 "horses" and 4-wheel drive put plenty of power behind the big, rugged, 2½-yard blade to move oversize loads each pass. By dozing in a "slot", to minimize spill off ends of blade, operator often moved as much as 3 cu. yds. per load. Instant, "no-shift" selection of 4 forward speeds saved loss of momentum . . . let operator drift loads in higher gears. Reverse speeds to 15 m.p.h. cut non-productive time on return half of dozing cycle, for more passes per hour. Giant 21.00 x 25, low-pressure tires gave plenty of sure-footed traction on rocky ledges and steep inclines . . . powerful air-actuated brakes on all 4 wheels assured dependable, safe control at all times.

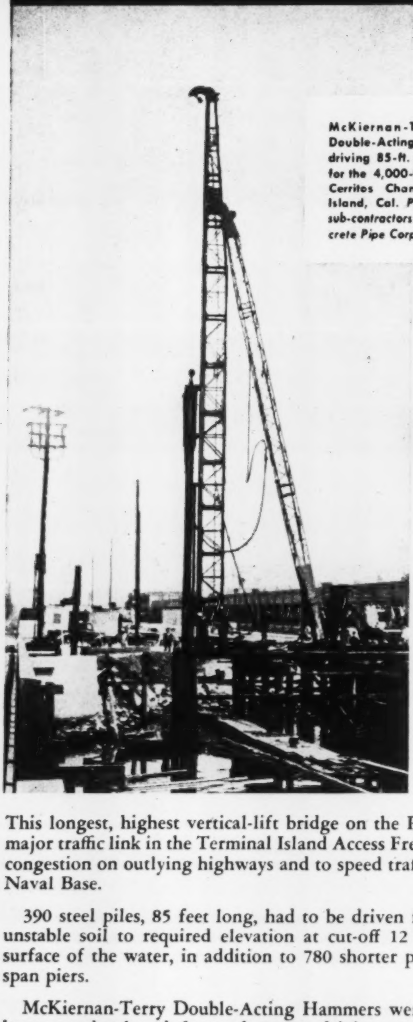
Other mining uses

This fast-working Tournadozer was operated by stripping contractors McFarland and Hullinger of Tooele, Utah, who also used it to sweep up the deposit face . . . and to feed blasted phosphate to loading plant. This same ability to move extra yards per hour . . . and handle extra jobs per year can increase ***your*** profits, too. Your local LeTourneau Distributor can show you how . . . see him about revolutionary Tournadozers TODAY.

LeT
EQUIPMENT
LETOURNEAU
PEORIA, ILLINOIS
HIGH-SPEED RUBBER-TIRED
IT'S RUBBER THAT PUTS


-tired "C" TOURNADOZER
in 35 eight-hour shifts
TOURNADOZERS
...THE ACTION IN TRACTION
Tournadozer—Trademark [illegible]

Driving 1170 Steel Piles Under Water



McKiernan-Terry 11-B-3 Double-Acting Pile Hammer driving 85-ft. steel H-beams for the 4,000-ft. bridge over Cerritos Channel, Terminal Island, Cal. *Proctor & Kuhn, sub-contractors to United Concrete Pipe Corp.*

This longest, highest vertical-lift bridge on the Pacific coast is a major traffic link in the Terminal Island Access Freeway, to relieve congestion on outlying highways and to speed traffic to the island Naval Base.

390 steel piles, 85 feet long, had to be driven full length into unstable soil to required elevation at cut-off 12 feet below the surface of the water, in addition to 780 shorter piles for the lift span piers.

McKiernan-Terry Double-Acting Hammers were the first pile hammers developed for underwater driving, and have held a reputation for underwater driving dependability through the years. That is why the 11-B-3 Hammer was chosen for this job.

Whatever the pile-driving problem may be, McKiernan-Terry offers the answer in a pile hammer line that includes 10 standard sizes in Double-Acting Hammers, 5 Single-Acting sizes and 2 Double-Acting Pile Extractors.

MK-266

McKIERNAN-TERRY FACILITIES

McKiernan-Terry engineering skill and wide manufacturing facilities are used also in such products as bulk materials unloaders, coal and ore bridges, marine equipment, bridge operating mechanisms and other important machinery serving industry, transportation and the government.

McKiernan-Terry
PILE HAMMERS and EXTRACTORS

FOR DATA AND SPECIFICATIONS write for McKiernan-Terry Circular #2, showing Double-Acting and Single-Acting Hammers in action.

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 7, N. Y.

McKiernan-Terry PILE HAMMERS AND EXTRACTORS

Now . . . after more than two years of actual field performance,

CARSET JACKBITS have proved that they can boost tonnage 20% or better and increase drilling speeds 50% or more!

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JACKBIT
THE
IR
SUPER-BIT
SET WITH CARBOLOY INSERTS

manufactured exclusively by

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

No Matter How Hard The Rock, you can drill it faster, easier and cheaper with Carset Jackbits. Here are some of the reasons why—all of them advantages that you can prove to your own satisfaction, on your own jobs.

CARSET JACKBIT FEATURES

- Carset Jackbits wear longer
- Drill faster, 50% or more
- Boost tonnage, 20% or better
- Eliminate tapered holes
- Save up to 30% on dynamite
- Reduce air consumption at least 40%
- Permit use of longer steel changes
- Drill full steel changes without binding
- Permit use of lighter drills
- Practically eliminate bit changes
- Reduce maintenance costs, 30% or more
- Eliminate need for much shop equipment
- Drill the hardest and toughest rock
- Finish more rounds per month

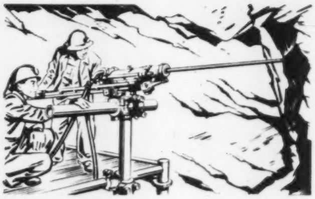
No wonder that operators call the Carset Jackbit

"the greatest single advance in rock drilling since the invention of the Jackhamer"

(see following pages)

RESULTS LIKE THESE WITH CARSET JACKBITS MEAN ONLY ONE THING:

a Complete rock drilling



SAVED $92.69 PER FOOT OF DRIFT. In driving a 12 x 20 foot 97-hole heading in taconite, a mining company required an average of 49.8 hours to pull a 5-foot round. With CARSET JACKBITS they pulled 6½-foot rounds and cut this time to 18.5 hours. Accurate cost records showed a direct saving of $92.69 per foot of drift, or $602.48 per round.

SAVED 65% ON BIT COST PER FOOT OF HOLE. On a large sewer project a contractor encountered tough drilling in hard, dense basalt. Steel bits used with J-50 Jackhamers averaged 1 foot of hole at a bit cost of 15 cents per foot. He now averages 260 feet per CARSET JACKBIT and bit cost per foot of hole is only 5¼ cents—a saving of 65% on ***bit costs alone.***

SIXTY PERCENT MORE PLUG HOLES PER DAY. In drilling large boulders for blasting in an open pit operation, Jackhamer operators increased drilling speed from 4 inches per minute with steel bits to 10 inches per minute with CARSET JACKBITS. This combination of higher drilling speed and the saving of time previously lost changing bits, resulted in 60% more plug holes per day.

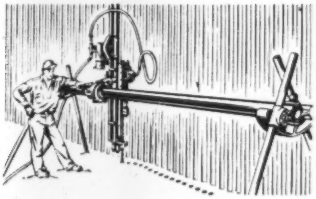
REDUCED BIT AND ROD COSTS 40% PER TON OF ORE. A mining company using conventional steel bits with 98-lb. Stopehamers, reports that their cost of steel bits and rods was 46.4 cents per ton of ore. With CARSET JACKBITS, the cost was 27.8 cents—a direct saving of 40% in bit and rod costs. Additional savings were made in air consumption, drill maintenance, and man-hours.

COULD HAVE SAVED $75,000 TO $100,000. A contractor on a dam project was drilling 18-foot holes in 66 minutes, with wagon drills and steel bits. With CARSET JACKBITS, he drilled 24-foot holes in 22 minutes—stepping up footage from 120 to 261 feet per shift. He said "If I'd had CARSET JACKBITS at the beginning of this job, I would have saved $75,000 to $100,000.

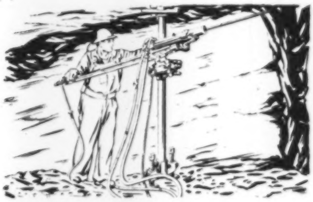
DRILL 300 FEET IN "6" ROCK." In a quarry, production costs were very high, due to extremely hard trap rock. This customer, using 45 lb. Jackhamers, reports that they required 4 steel bits for a 2-foot change. Now, with CARSET JACKBITS, he is averaging over 300 feet per bit! Rod life and drilling speed have been greatly increased and drill maintenance costs reduced.

No matter how hard the rock, you can drill it faster, easier and cheaper

Revolution in performance and costs!



RECONDITIONING COSTS PRACTICALLY ELIMINATED. A granite quarry previously using steel bits, found it necessary to run bit reconditioning equipment two 8-hour shifts per day. Now, with all drilling done by CARSET JACKBITS, this operation has been almost eliminated. The management has also cut out one drill altogether because the drilling speed was so much greater.



MINERS DRILL AND BLAST ON SAME SHIFT. A mining company, drilling in a very hard quartzite, reports that CARSET JACKBITS have completely revolutionized their mining procedure. Miners now put in their rounds so fast that they can blast on the same shift. With steel bits, blasting previously had to be done on the second shift. This customer has converted to CARSET JACKBITS 100%.

with Carset Jackbits

Long before the first CARSET JACKBIT appeared on the market, years of factory research and testing had proved what it could do. Results, even in the early development stage, were almost unbelievably good when compared to the performance of conventional steel bits.

Yet, today, these results have been far surpassed in the field. Today CARSET JACKBITS are out-lasting steel bits by 50 feet-to-one, 100-to-one, and in many cases by as much as 400-to-one!

These are **proven facts**—established beyond question by mining and construction operators who have been using CARSET JACKBITS on their own jobs, under their own widely varying conditions. In the opinion of these operators, the new I-R Super-bit has completely revolutionized the business of rock drilling.

On these pages, for example, are specific reports which typify the experience of hundreds of users. As more and more of these reports come in, it becomes evident that the CARSET JACKBIT will eventually make obsolete practically all steel bits—including most of our own. That means a revolution in our business as well as yours. But why not? Ingersoll-Rand has always sought to replace good products with still better ones. And the CARSET JACKBIT has **proved** to be a better product—radically better. That's why we have put it into full production—in a wide range of sizes to meet every rock drilling requirement.

CARSET JACKBIT
THE SUPER BIT
SET WITH CARBOLOY INSERTS

manufactured exclusively by

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.

CARSET JACKBITS are now available in a complete range of sizes for practically every drill and hole size.

The following CARSET JACKBITS will meet the requirements of practically every rock drilling job. Because there is no appreciable gauge loss, one bit size is all that is needed for any given application. With the exception of Quarrymaster Bits (which have side holes only) all CARSET JACKBITS have both center and side holes.

1⅜″ 1 ⅜″ 11XCS4 **1⅜″ dia., for Series 11 Jackstud.** For use with Jackhamers as well as small-bore drifters Ideal for plugging and general small-hole drilling.	**1¾″** 1 ¾″ 15XCS4 1 ¾″ Ty1XCS4 **1¾″ dia., for Series 15 Jackstud and Type 1 Attachment.** General-purpose bits for use with Drifters up to 3½″ bore, Wagon-Drills, Jackhamers and Stopehamers.	**2¼″** 2 ¼″ Ty3XCS4 **2¼″ dia., for Type 3 Attachment.** For the heaviest duty service, with 4″ wagon drills and drifters, where 2¼″ bottoming size is required. Also for blast hole drilling with Type 2 coupled steel.
1½″ 1 ½″ 13XCS4 **1½″ dia., for Series 13 Jackstud.** For use with all drills up to and including 3″ bore machines.	**1⅞″** 1 ⅞″ 15XCS4 **1⅞″ dia., for Series 15 Jackstud.** General-purpose bits for use with Drifters up to 4″ bore. Wagon-Drills, Jackhamers and Stopehamers. This bit can be used instead of the 1¾″ size when extra chip clearance is required.	**5¼″** 5 ¼″ QMX2S4 **5½″** 5 ½″ QMX2S4 **5¾″** 5 ¾″ QMX2S4 **6″** 6″ QMX2S4 **CARSET BITS** are available in four sizes for use with the QUARRYMASTER DRILL. These machines are revolutionizing drilling procedure in quarries, strip mines and heavy construction work.
1⅝″ 1 ⅝″ 13XCS4 1 ⅝″ 15XCS4 **1⅝″ dia., for Series 13 and Series 15 Jackstuds.** The series 13 bit for use with all drills up to and including 3″ bore machines. The series 15 bit for use with all drills up to and including 3½″ bore machines.	**2″** 2″ Ty2XCS4 **2″ dia., for Type 2 Attachment.** For the heaviest duty service, with 4″ wagon drills and drifters. Also for blast hole drilling with Type 2 coupled steel.	

FOR THE COMPLETE STORY

Ask for our comprehensive pocket size catalog No. 4091. It tells the entire story. It contains numerous case histories and many helpful hints on how to get the most out of CARSET JACKBITS.

Ingersoll-Rand Company
11 Broadway, New York 4, N. Y.
Dept. RD-10

.... Please send me CARSET JACKBIT Catalog No. 4091

.... Please have CARSET JACKBIT representative call.

NAME ....

POSITION ....

COMPANY ....

STREET ....

CITY .... STATE ....

2

You can use CARSET JACKBITS
with the new I-R
Jackstud Attachment
or with your present
Type 1, 2 and 3 Attachments

Jackstud Attachments permit the use of superior nickel alloy drill steels. I-R Spec. No. 139. Operators report from 50 to 200% longer rod life. Jackstuds are available in Series 11, 13 and 15—with 11/16, 13/16 and 15/16 inch thread diameters respectively.

You can also use CARSET JACKBITS with your present Type 1, 2 and 3 Attachments (I-R threaded drill steel connections), which are giving such excellent service the world over. The performance of these rods with CARSET JACKBITS is even better than with steel Jackbits.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, NEW YORK 368-15

A Million Yards a month

CUMMINS DIESEL
SINCE 1919 PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

When you SPECIFY CUMMINS you get:

- **Fast work cycles**
- **Fuel savings**
- **Low maintenance**
- **Minimum down-time**
- **Long engine life**
- **Warranty—100,000 miles or one year**
- **'Round-the-clock service**

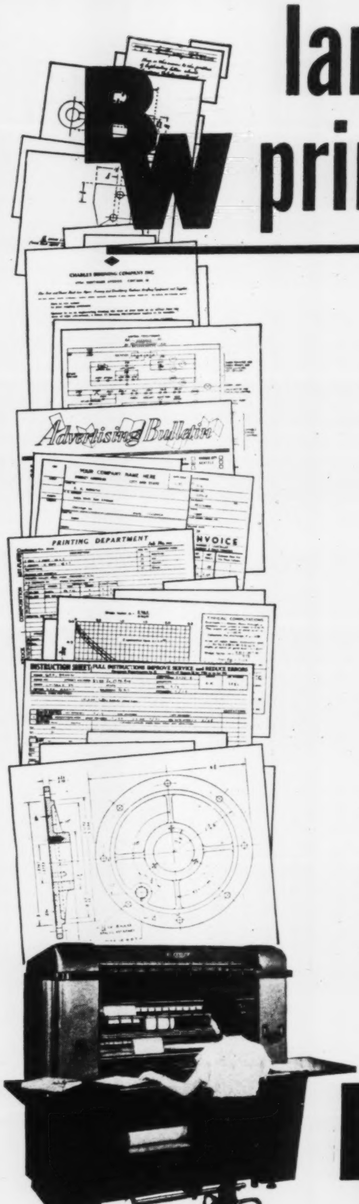
A million yards a month for six months—that's the earth-moving record of C. J. Langenfelder and Son, Inc., on the Baltimore, Md., Friendship International Airport job. And 23 Cummins Diesels helped set this record.

For example, 11 Cummins-Powered Super C Tournapulls made seven round trips an hour on a 1⅞-mile haul, carried 15-yard loads at top speed on soft sand. Cummins Power also proved itself on this job in Wooldridge Terra-Cobras, Euclid Bottom Dumps, Mack tractors, a Lima shovel, and a Euclid loader.

Write for more information about the proved performance and economy of Cummins Diesels.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

BW large volume print production



Never before has a single Whiteprinter been able to offer you all the advantages found in this new Volumatic Model 93. It is the last word in large volume production of high quality direct positive BW prints. Advance models of this machine have already proved that it can reduce reproduction costs . . . by faster production, less wastage, lower maintenance, simpler operation.

It has countless uses. The Volumatic, like other Bruning Whiteprinters, produces sharp, highly legible copies of engineering drawings and documents . . . in fact anything that is printed, drawn, written, or typed on a translucent medium. Its uses increase daily as more and more business and industries turn to Bruning Whiteprinters to eliminate the costly practice of transcribing documents, forms and records of all kinds.

It is extremely versatile. The Volumatic Model 93 takes cut sheets or roll stock with equal facility. It produces sharp BW prints from post card size up to 42-inches wide and unlimited length. You can have light, medium or card weight prints . . . prints on tinted stocks . . . prints on film or cloth . . . prints with colored lines.

Any one can operate it. The operation of the BW Model 93 has been simplified to the point where a girl can learn to operate it in less than an hour.

Faster operation. The new Volumatic produces BW prints up to 105 square feet a minute *at normal operating speeds*. The prints are delivered dry and ready for instant use, neatly stacked at the front or rear of the machine as desired.

Completely odorless. The developing solutions used to produce sharp clear Bruning Whiteprints are harmless and odorless. The machine does not require outside ventilation or exhaust ducts. It can be installed anywhere without offense.

It is mobile. There are no pipe or plumbing connections to tie this machine to one spot. It is built on casters so that it can be moved easily to efficient locations.

Uniform quality control. BW Model 93 automatically and instantaneously coordinates developing and printing speeds. Changes in printing speed never result in over-or-under developed prints. A further safeguard to quality is Bruning's built-in constant voltage transformer which assures uniform operation of the machine although line voltages may vary from 190 to 250 volts AC.

***Send today* for full information.**

Let us send you a complete file of literature describing the new BW Model 93 and the BW mediums you can use with it. See for yourself the extreme versatility, economy and speed of this machine. There is no obligation.

BRUNING BW WHITEPRINTER 93

VOLUMATIC MODEL

Other Bruning products you should know about— Drafting Machines • Sensitized Papers & Cloth • Tracing Papers • Erasing Machines • Drafting Room Furniture • Slide Rules • Surveying Instruments • and many other products.

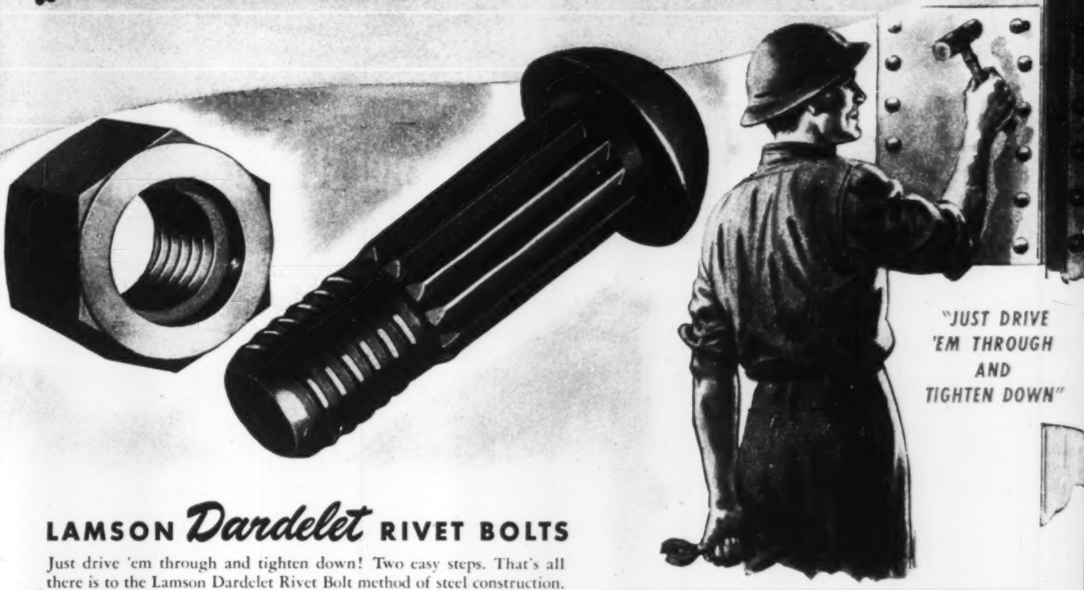
Charles Bruning Company, Inc.

4714-20 West Montrose Avenue, Chicago 41, Ill.

New York • Chicago • Los Angeles • and 11 other cities

Sturdy Steel Structures

with A MAN...A MAUL...A WRENCH!



LAMSON *Dardelet* RIVET BOLTS

Just drive 'em through and tighten down! Two easy steps. That's all there is to the Lamson Dardelet Rivet Bolt method of steel construction.

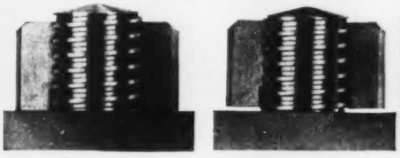
Yet tests have shown that the Dardelet Method is *far superior* in all important respects to hot riveting.

First, it costs *less* because Dardelet Rivet Bolts can be driven faster—*more* per day—and no expensive heating and driving equipment is required. Secondly, laboratory research proves that Dardelet Rivet Bolts provide stronger joints, higher resistance to vibration—plus shear and bearing values equal to those of power driven rivets or turned bolts in reamed holes.

The heavy splines on the bolt shank grip the steel and prevent turning while the Dardelet locking principle (see illustration) guarantees a sure-lock of the nut to the bolt.

Yes, you can simplify your steel construction, save money and get superior results by using Lamson Dardelet Rivet Bolts.

THE DARDELET LOCKING PRINCIPLE



Distributed Exclusively By { **UNITED STATES STEEL SUPPLY CO.**
SUBSIDIARY OF THE U. S. STEEL CORPORATION
Warehouses in Principal Cities

THE LAMSON & SESSIONS COMPANY
1971 West 85th Street • Cleveland 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

SPECIAL PURPOSE
Lamson + Sessions
FASTENERS

• FURNITURE BOLTS • SEMI-FINISHED NUTS • LAMSON LOCK
STEP BOLTS • ELEVATOR BOLTS • STOVE RODS • TRACTOR BOLTS
LTS • SPRING CENTER BOLTS • HUB and WHEEL BOLTS • CONNECTI
ONE NUTS • BARREL NUTS • OBLONG NUTS • CABINET BED BOLTS
S • PLASTIC INSERTS • EYE BOLTS • CLEVIS PINS • HINGE PINS •
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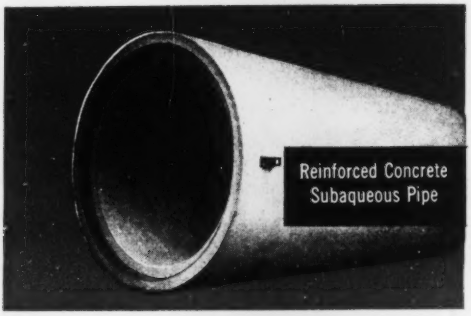
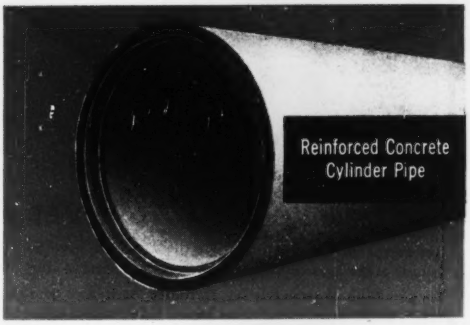
WEATHER-TIGHT BOLT
SCREWS • CAP SCREWS • FIN HEAD BOLTS

Prestressed Concrete Cylinder Pipe


Reinforced Concrete Subaqueous Pipe

let LOCK JOINT solve your water supply problems

Reinforced Concrete Pressure Pipe


Reinforced Concrete Cylinder Pipe

Lock Joint's four designs of reinforced concrete pressure pipe answer any problem in the field of large-diameter water supply conduits.

All of these designs may be equipped with Lock Joint's flexible, self-centering Rubber and Steel Joint, which simplifies installation and reduces the initial cost of laying the line.

Lock Joint Reinforced Concrete Pressure Pipe is made in all standard diameters from 16" up, and will withstand any pressure common to American water works practice.

★ ★ ★

Your inquiry at any of the Company's offices will receive a prompt reply.

LOCK JOINT PIPE COMPANY

Est. 1905

P. O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS
Wharton, N. J., Turner, Kansas

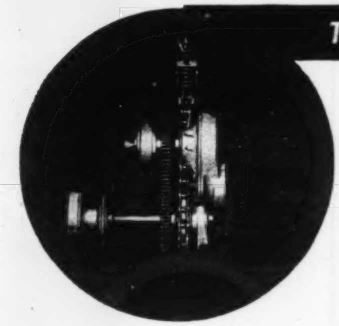
BRANCH OFFICES:
Cheyenne, Wyo. • Denver, Colo. • Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. • Wichita, Kan. Kenilworth, N. J. • Hartford, Conn.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

SCOPE OF SERVICES

Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

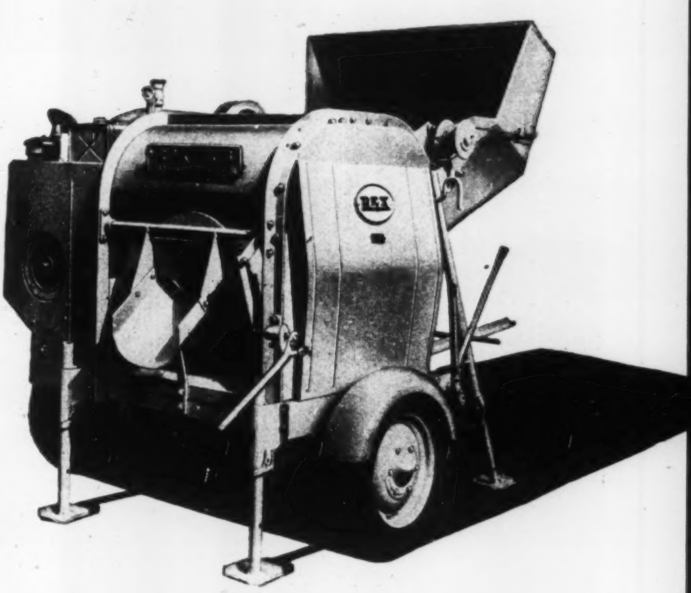
★ ★ ★



THE CHAIN TAKES THE STRAIN

The exclusive Rex Chain Drum Drive eliminates stresses and strains. The chain protects the transmission . . . gears . . . shafting . . . power plant. It eliminates binding between drum and transmission during the mixing action. And since the chain transmits power in the "up" direction, the load on the drum rollers is materially reduced.

the Mixers that give you MOST!



Lower Maintenance and Operating Cost

The Rex Chain Drum Drive permits weight to be properly distributed throughout the mixer for extra long life. It eliminates the need for bulky, excessively heavy transmission cases, shafting, bearings, etc. The weight saved here permits us to build added wearing life into parts where it is needed most . . . blades, drum rollers, drum shell and drum supports without sacrificing extreme portability. A Rex Mixer just has to deliver the lowest operating and maintenance costs of any mixer.

The REX "Easy Arc" Controls

Rex Mixers are designed to turn out *more* batches per day with far less manual effort. Operator can handle all controls from one spot. All have ample leverage . . . swing through short, easy arcs for safe, convenient, easy operation. For example, the discharge chute . . . it's outside the drum while mixing, and the operator just gives the lever an easy push that swings the chute into the drum. He doesn't have to lift a chute-full of concrete as is the case on the ordinary chute that's inside the drum during mixing.

There are a lot of other important "Plus" advantages of Rex Mixers. For all the facts, see your Rex Distributor, or write for your copy of Bulletin No. 47-10. Chain Belt Company, 1633 West Bruce Street, Milwaukee 4, Wis.

CHAIN BELT
REX
COMPANY

CONSTRUCTION MACHINERY

Super-Power for Matchless Performance

There is No Substitute for All-Wheel Drive and All-Wheel Steer in a motor grader . . . no way in which any rear drive, front steer machine can equal the maneuverability, power-at-the-blade, and all-around performance of an Austin-Western "88" or "99".

With All-Wheel Drive, there are no idling front wheels—no dead front end to consume power and decrease operating efficiency. All weight is on driving wheels—front and rear—contributing 100% to traction and utilizing the full power of the engine.

All-Wheel Steer provides unequalled maneuverability; saves time on every job; makes it possible to work in places where ordinary motor graders cannot go—do things they cannot do.

Get the complete story of the many additional features of these outstanding graders from your A-W distributor, or send for the latest bulletins.

AUSTIN-WESTERN COMPANY, AURORA, ILL., U.S.A.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

No one has ever been able to improve on

The WHITE of MEDUSA WHITE

T. M. Reg. in U. S. Pat. Off.

Over forty-two years ago, a Medusa scientist created the first white Portland Cement. Since then, many have tried but *no one has been able to improve on the whiteness or the quality of Medusa White.* Builders have chosen Medusa White thousands and thousands of times for buildings all over the world . . . under all climatic conditions. In every case, Medusa White because of its true white color has given complete satisfaction whether used white or tinted. Time has proved Medusa White the most dependable of all white cements. *There is no whiter white, no finer white than Medusa White!*

Medusa Waterproofed White is used by builders where lasting beauty and all weather protection is required. This is regular Medusa White Portland Cement with waterproofing ground in at the mill. This waterproofing material is in concrete, mortar or stucco *all the way through* and repels moisture *at the surface.* Thus dirt cannot stain and water cannot enter, freeze and disintegrate concrete or stucco made with Medusa Waterproofed White Portland Cement.

For sparkling white stucco, cast stone, terrazzo and other white concrete uses (floors, curbing, street and traffic markers) . . . for construction that will retain its beauty indefinitely, *use Medusa White.* And for the full story about the many uses of this remarkable cement, send the coupon for your copies of "A Guide to Finer Stucco" and "Medusa White Portland Cement."

"FIFTY-SEVEN YEARS OF CONCRETE PROGRESS"

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CAST STONE

TERRAZZO

NON-STAINING
PORTLAND CEMENT
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CLEVELAND, OHIO
NET
94 LBS.
NON-STAINING
PORTLAND CEMENT
MEDUSA WHITE

MEDUSA PORTLAND CEMENT CO.

1001-2 MIDLAND BUILDING • CLEVELAND 15, OHIO

Gentlemen:

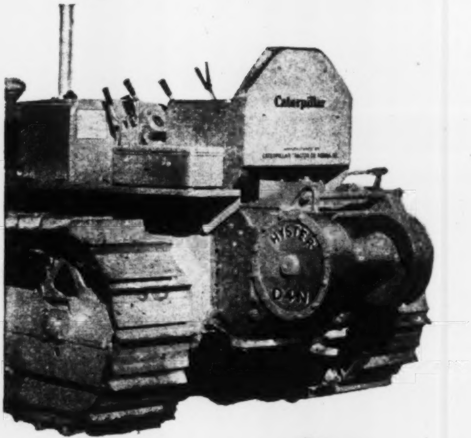
Please send me a copy of the booklets entitled, "A Guide To Finer Stucco" and "Medusa White Portland Cement."

Name ....

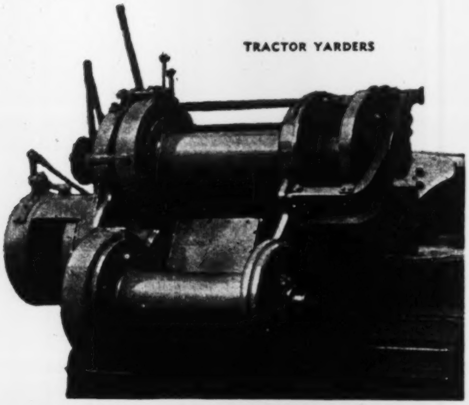
Address ....

City .... *State* ....

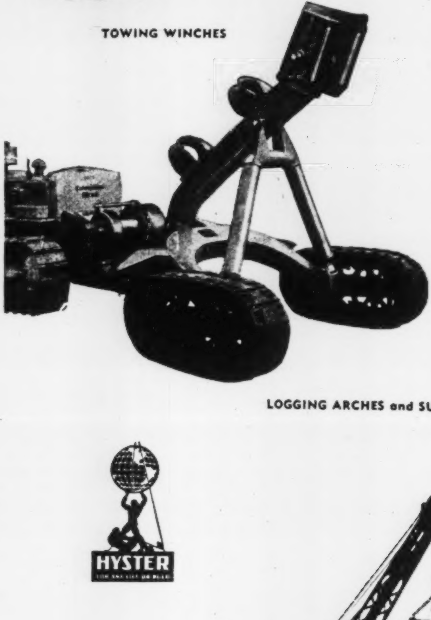
Also made by Medusa Products Company of Canada, Ltd., Paris, Ontario



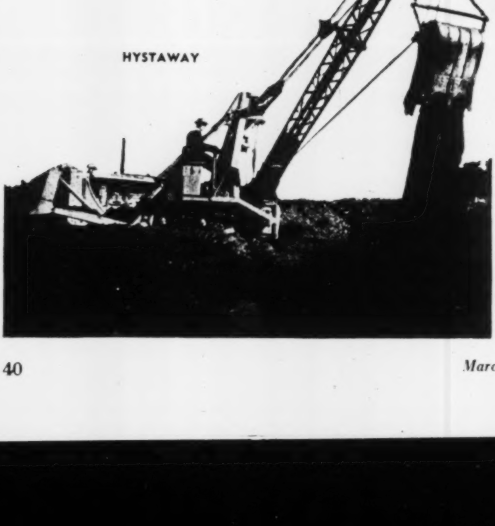
TOWING WINCHES



TRACTOR YARDERS



LOGGING ARCHES and SULKIES



HYSTAWAY

29 Tractor Tools for greater work production

For almost 20 years Hyster has been making a full line of equipment for use with "Caterpillar" track-type tractors

The current line of 29 tractor tools includes towing winches, yarders, donkeys, cranes, logging arches, sulkies and the Hystaway—the revolutionary tractor tool that combines clamshell, dragline, crane and bulldozer: all tractor mounted.

Your "Caterpillar" distributor sells and services Hyster tractor equipment. See him for information. Write for catalogs.

HYSTER COMPANY

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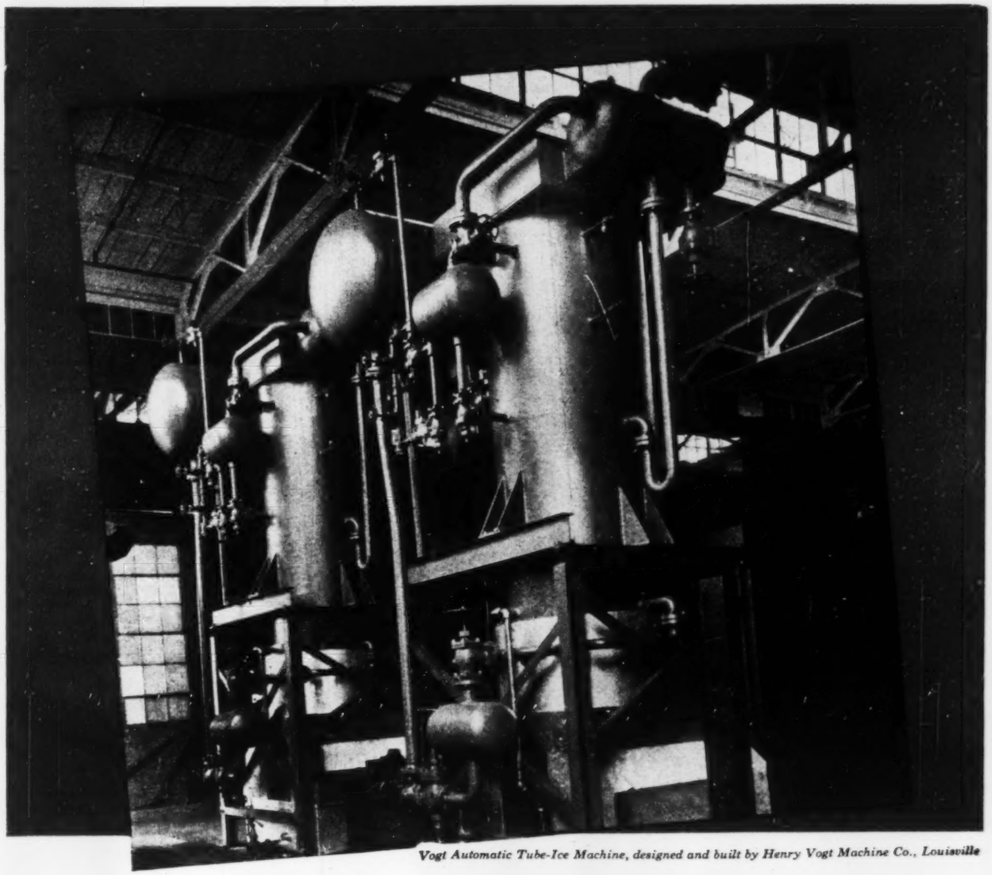
1853 NORTH ADAMS STREET, PEORIA 1, ILLINOIS



Vogt Automatic Tube-Ice Machine, designed and built by Henry Vogt Machine Co., Louisville

Hottest little ice maker

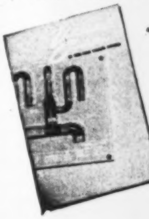
HERE is the greatest modern advance in ice making—the *Vogt Automatic Tube-Ice Machine* which eliminates all of the work, much of the power, and saves 90 per cent of the space used by can-ice plants for same capacity. It's a boon to hotels, restaurants, milk plants, packing houses, and other large users of sized ice. And it's another "natural" among applications for Tube-Turn welding fittings.

At points of direction change in the machine's piping system, the *fittings that become part of the pipe* assure permanently leakproof joints, and smooth flow. They help save that space, and weight. They help keep fabrication cost down because they're easy to connect, dimensionally accurate. Labeled "Tube-Turn", they're tops in every quality expected of welding fittings.

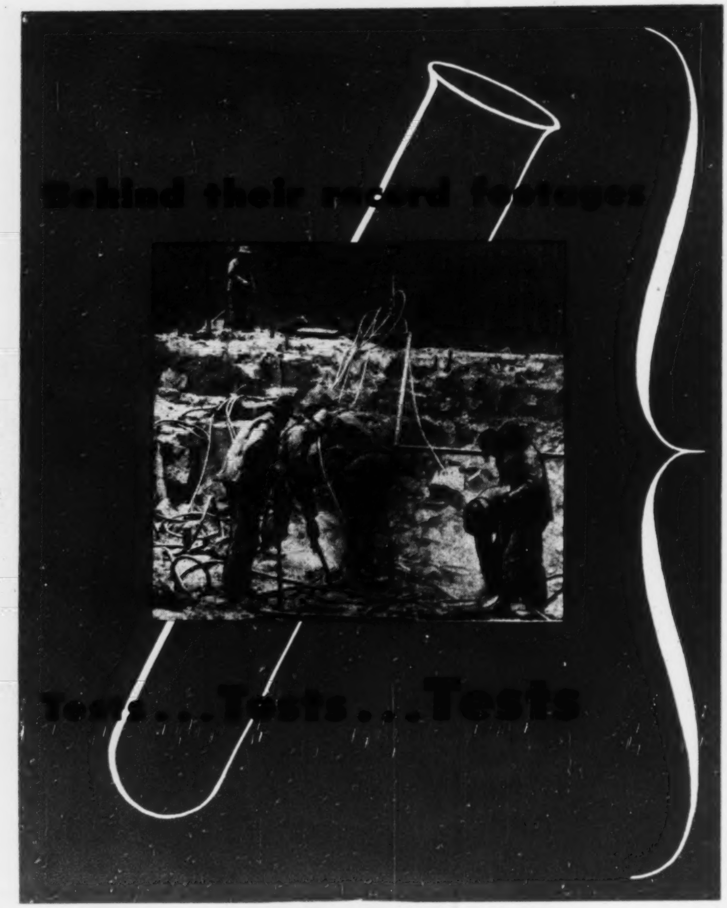
Got an equipment piping problem? You are invited to consult with Tube Turns' Engineering Service Division. Get in touch through your Tube Turns distributor. He is backed for service by the organization that's miles ahead in piping engineering.

TUBE TURNS, INC.
230 E. Broadway, Dept. E, Louisville 1, Ky.
District Offices at New York, Philadelphia, Pittsburgh, Chicago, Houston, Tulsa, San Francisco, Los Angeles

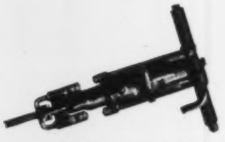
TUBE-TURN
TRADE MARK
tt
WELDING FITTINGS AND FLANGES

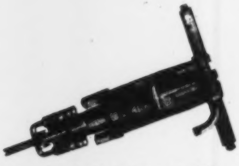


Write for data booklet, "Volumetric Capacities of Tube-Turn Welding Fittings."



Gardner-Denver S33 — known as the most powerful 31-pound drill in its class.


Gardner-Denver S45 — a champion in soft and medium formations.


Gardner-Denver S55 — the most popular 55-pound sinker on the market.

Gardner-Denver S73 — 67 pounds of speed and power for the deeper holes, the hardest rock.

IT TAKES continuous testing to produce a champion. That's why these easy riding Gardner-Denver Sinkers—combining high speed, exceptional hole cleaning and powerful rotation—continue to pile up record footages even under grueling service conditions.

Skilled metallurgists test all raw bar stock and forging billets for alloy content and hardening ability. All finished pieces—designed for 100% interchangeability—undergo repeated fatigue, destruction and drill lubricant tests. And before shipment, every complete Gardner-Denver Sinker is machine tested to meet rigid performance standards.

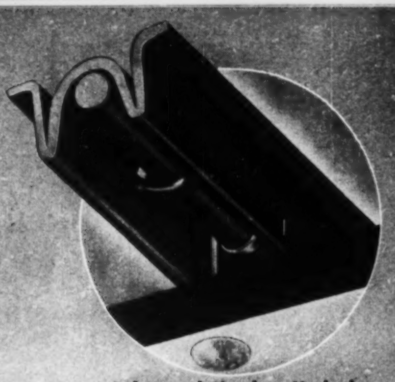
Remember, too, that Gardner-Denver field service is second to none. Branch offices—located all over the world—are staffed by factory-trained field representatives experienced in mining and construction work.

For complete information, write Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER SINCE 1859

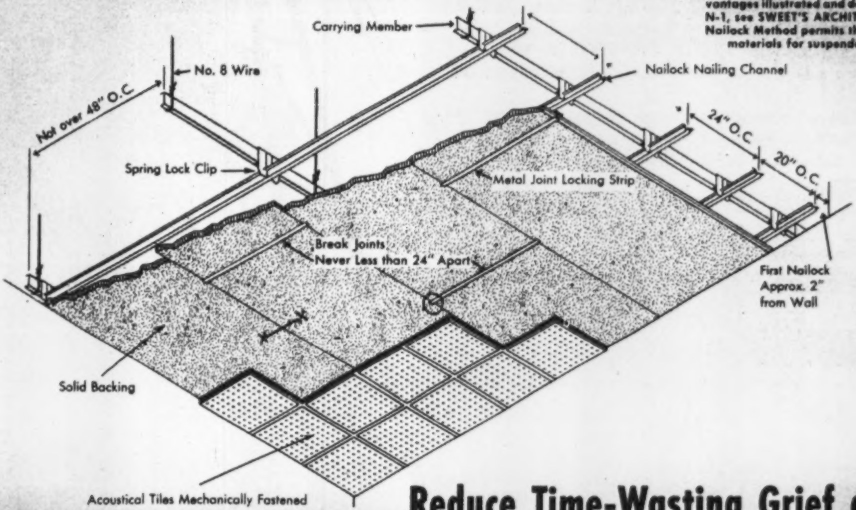
For Suspended Ceiling Construction

Use Nailock

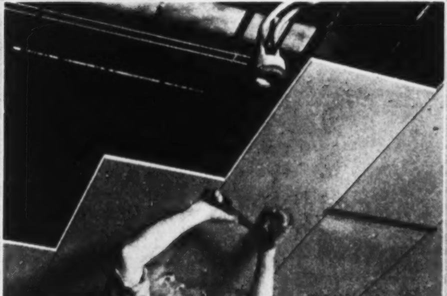


Safest and Simplest Method

The Nailock Method is the simplest and safest method of installing a suspended ceiling with or without acoustical tiles. This method presents many exclusive advantages illustrated and described in Nailock Catalog N-1, see SWEET'S ARCHITECTURAL FILE, 11b/1. The Nailock Method permits the use of a wide variety of materials for suspended ceiling construction.



Carrying Member
No. 8 Wire
Not over 48" O.C.
Nailock Nailing Channel
24" O.C.
20" O.C.
Spring Lock Clip
Metal Joint Locking Strip
Break Joints Never Less than 24" Apart
First Nailock Approx. 2" from Wall
Solid Backing
Acoustical Tiles Mechanically Fastened

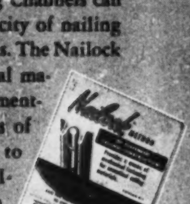


Permits Use of Any Acoustical Materials Required

Installation with Nailock requires only three operations. This shows nailing solid backing to Nailock Universal Nailing Channel with Nailock Nails which form locking loop around rod. Assures rigidity and permanency and safety.

Reduce Time-Wasting Grief and Time Costs on Suspended Ceiling Jobs

● Nailock Universal Nailing Channels provide a means for securely fastening every unit in place, and assure a rigid, safe and permanent suspended ceiling installation. It permits the use of larger crews in making installations in large areas due to the speed with which Nailock Universal Nailing Channels can be attached to carrying members and the simplicity of nailing backing or backerboard materials to these channels. The Nailock Method permits the use of any type of acoustical materials attachable by mechanical means, or by cementing, and all of the usual methods and materials of finishing a ceiling, including plastering. Refer to Nailock Catalog N-1 in SWEET'S 1949 ARCHITECTURAL FILE, 11b/1. Catalog available on request. Please use coupon.



NAILOCK STEEL DIVISION
THE SANYMETAL PRODUCTS CO., INC.
1704 URBANA ROAD • CLEVELAND 12, OHIO

Nailock Steel Division, The Sanymetal Products Co., Inc.
1704 Urbana Road, Cleveland 12, Ohio

Please send Nailock Catalog N-1 and name of nearest Nailock Distributor.

Name .... *Position* ....
Company ....
Address ....
City .... *State* ....
(Please attach to your business letterhead)

In all construction...

IT'S A CINCH WITH

TULSA WINCH

A Tulsa Winch on your truck will increase its working capacity, give trouble-free performance with dependability and SAFETY. Tulsa Winches are built in standard models, and in special electrical utility models for many uses . . . lifting, hauling, pulling, stretching cable, etc.

Tulsa Winch will HOLD THE LOAD. Men and loads are safe due to the positive exclusive back-off brake.

TULSA WINCH WITH EXTENDED DRUM SHAFT

Built to Specifications for Public Utility Companies. Note Detachable Cathead and Adapter. Write for Bulletin.

Tulsa Winch

TULSA, OKLAHOMA

DIVISION OF VICKERS Inc.

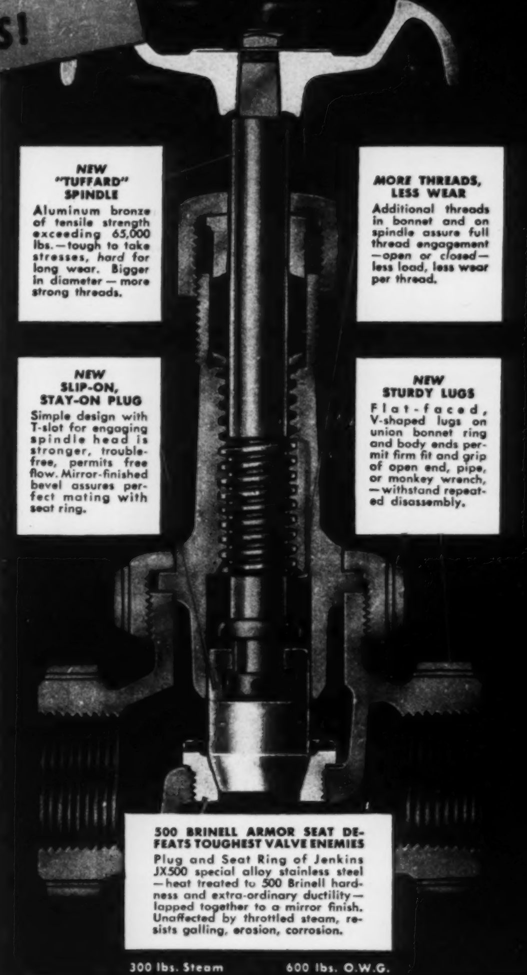
It's New!
JENKINS ANSWER TO VALVE-KILLING SERVICES!
JENKINS

JENKINS Fig. 976-A

PLUG TYPE

Armor Seat

BRONZE GLOBE VALVE



NEW "TUFFARD" SPINDLE

Aluminum bronze of tensile strength exceeding 65,000 lbs.—tough to take stresses, hard for long wear. Bigger in diameter — more strong threads.

MORE THREADS, LESS WEAR

Additional threads in bonnet and on spindle assure full thread engagement —open or closed— less load, less wear per thread.

NEW SLIP-ON, STAY-ON PLUG

Simple design with T-slot for engaging spindle head is stronger, trouble-free, permits free flow. Mirror-finished bevel assures perfect mating with seat ring.

NEW STURDY LUGS

Flat-faced, V-shaped lugs on union bonnet ring and body ends permit firm fit and grip of open end, pipe, or monkey wrench, —withstand repeated disassembly.

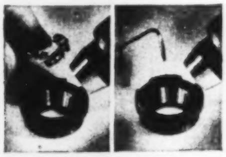
500 BRINELL ARMOR SEAT DEFEATS TOUGHEST VALVE ENEMIES

Plug and Seat Ring of Jenkins JX500 special alloy stainless steel —heat treated to 500 Brinell hardness and extra-ordinary ductility— lapped together to a mirror finish. Unaffected by throttled steam, resists galling, erosion, corrosion.

300 lbs. Steam 600 lbs. O.W.G.

BUILT TO BREAK RECORDS FOR LONG LIFE

Now, for the most severe services, you can choose the new Jenkins Fig. 976-A with complete confidence that it will set new economy records. Use it for pressure regulation, bleeds, drips, and drains, or any close regulation of steam that threatens wire drawing. It will lower maintenance, last longer, where entrapped pipe chips, scale, or rust tubercles are a problem.



SMASHED PIPE CHIPS, WIRE, LEAVE NO SCARS

Steel pipe chips and 1/16" wire rod, with Brinell hardness in excess of 300, were crushed between the new Jenkins JX500 Plug and Seat Ring without leaving a scratch or dent. That's proof of super hardness!

Compare Fig. 976-A, part for part, and see why it's as nearly wear-proof, trouble-proof, and maintenance-free as any stock valve can be. Only a few of the dozen ways it's better are shown here. Get the complete story in the new folder. See why it's unrivalled for endurance and economy, —why it's your best buy in plug-type valves! Use coupon.

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

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JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

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Company..

Address...

....

After holing through, Supt. Sam Allen (right) on Brooklyn side greets Supt. Andy Amisano and General Supt. Harry Stripling (left) in Manhattan tunnel.

Holing-Through N.Y.'s Brooklyn-Battery Tunnel

Another Du Pont Dynamite Job

In driving the 9,117-foot, $80,000,000 vehicular tunnel beneath New York Harbor, construction engineers unhesitatingly approved selection of Du Pont Dynamites for all blasting operations. Another project of the Triborough Bridge & Tunnel Authority, New York, it is the second longest vehicular tunnel, in the world. It will consist of twin cast-iron tubes 31-feet in diameter, tile-lined, to provide four lanes that will readily handle an estimated total of 16,000,000 vehicles annually.

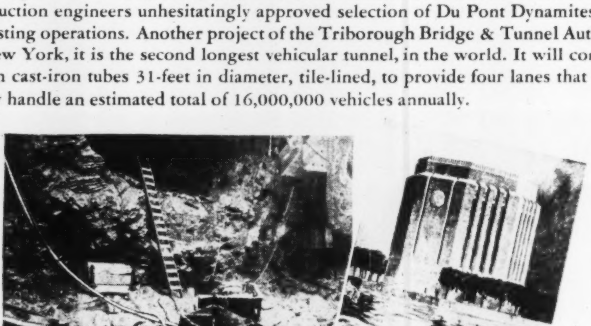


Photo above shows east tunnel from air shaft sunk in solid rock, 140-feet below surface at midway point. Sketch at right shows ventilating building designed by McKim, Mead & White, architects. It forms a manmade island in the bay.

Battery Tunnel contractors using Du Pont Dynamites included: Mason & Hanger Co., Inc.; and George H. Flinn Corporation.

Whenever you have a job of blasting . . . ask your Du Pont Explosives representative for complete information about Du Pont Dynamites and job-speeding blasting supplies to meet your specific requirements for an economical and efficient operation.

E. I. DU PONT DE NEMOURS & CO. (INC.)
Explosives Department
Wilmington 98, Delaware

DU PONT EXPLOSIVES

(ELECTRIC BLASTING CAPS "NITRAMON"† DYNAMITES
BLASTING SUPPLIES AND ACCESSORIES)

†Reg. Trade-mark for nitrocarbonitrate blasting agent.

Contractors and Engineers Endorse These Tunnel-Driving Products

Whether the job is a great engineering project or a minor work of construction, Du Pont Explosives, blasting supplies and accessories are used with confidence by contractors and engineers everywhere.

DU PONT
SPECIAL GELATIN

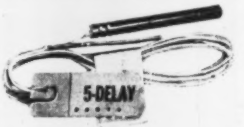
. . . used in driving the Brooklyn-Battery Tunnel has long been a favorite with blasters on all types of construction work. Plastic, cohesive, easy to handle, water-resistant.

DU PONT "GELEX"*

. . . economical, semi-gelatinous dynamite also used in the Tunnel is supplied with or without perforated cartridges. Plastic and highly water-resistant

DU PONT "SERIES B" DELAY ELECTRIC BLASTING CAPS

. . . a recent addition to the extensive line of Du Pont Caps. Recommended for rotational shooting. The "Series B" is designed to eliminate risk of misfires due to arcing or "water hammer."



DU PONT
ELECTRIC BLASTING CAPS . .
"MS" (millisecond) DELAY CAPS--

Galvanometers . . Rheostats
Blasting Machines . . . Tamping Plugs
Leading Wire . . . Connecting Wire

*TRADE MARK REG. U. S. PAT. OFF.

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REG. U. S. PAT. OFF.

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. . . THROUGH CHEMISTRY

FASTER LOADING

Another
COST-CUTTING
Application
of
VICKERS
Hydraulics

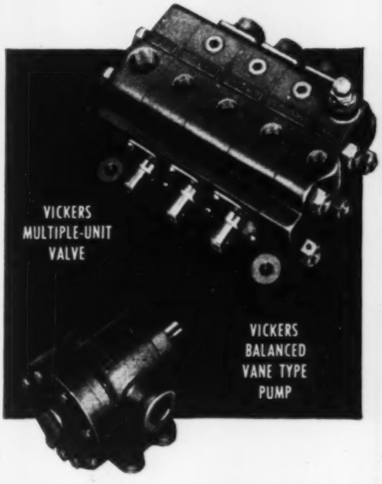
ATHEY Model 3 FORCE-FEED LOADER
SELF-PROPELLED

One important reason why users of the Athey Force-Feed Loader report savings in time and money is because it is equipped with Vickers Hydraulic Controls. A Vickers Multiple-Unit Valve is used to raise and lower the moldboard, throat, feeder and conveyor. Hydraulic power is supplied by a Vickers Balanced Vane Type Pump driven from the engine crankshaft pulley.

The Vickers Sectional Type Multiple-Unit Valve, available in many combinations for operating single- or double-acting cylinders, provides convenient and selective control. Ask for Bulletin 40-13.

Vickers Balanced Vane Pumps are outstanding for their long life and efficient operation. Their exclusive hydraulic balance construction entirely eliminates pressure-induced bearing loads and resulting wear. Longer life and less hydraulic slip are insured at maximum operating pressures. Ask for Bulletins 36-12 and 49-52.

3823



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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

W-SPEED PATROL
BD-3
BD-2
AD-3
AD-4

Choose the size

FROM ALLIS-CHALMERS' COMPLETE LINE

FOUR DIESEL-POWERED MODELS — all full-fledged construction machines — each one easily handles ditching, sloping, scarifying, black-top mixing, snowplowing, sod removal . . . as well as maintenance. Differences in weight, speeds, horsepower and cost enable you to match the machine to the job to be done . . . and to your budget.

LOW COST W-SPEED PATROL — long popular as an economical maintainer with townships, cities, counties . . . and with contractors for keeping up hauling roads and finished sections on their job. Gasoline powered, electric lights and starter, simple-to-operate controls.

Whatever your motor grader needs . . . your Allis-Chalmers dealer can fill 'em!

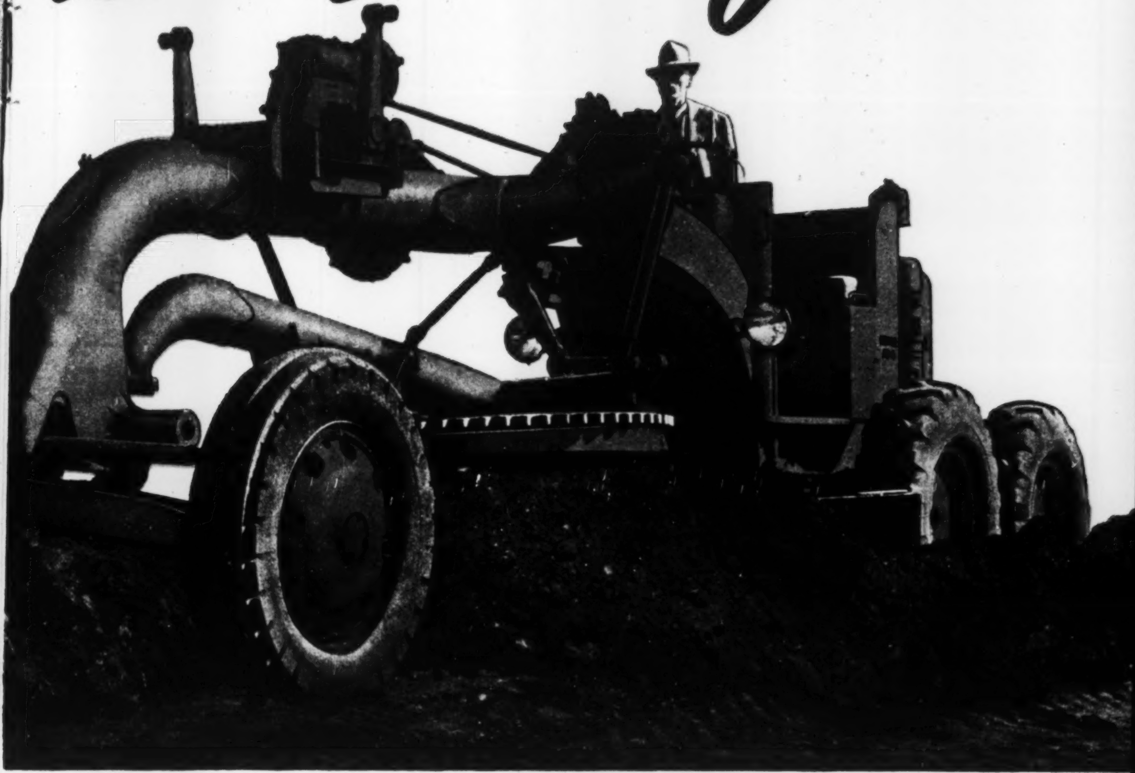
AD-4
104 brake hp.
22,140 lbs.

SAME OUTSTANDING ADVANTAGES ON ALL AD AND BD MODELS

AD-3
78 brake hp.
21,835 lbs.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

that fits the job



- A strong, shock-absorbing tubular frame that also protects control rods inside frame.
- High axle and throat clearance for handling bigger windrows without interference.
- Rounded construction of steering knuckles, spindles and drag links to prevent material from packing . . . assures unhindered operation.
- "Roll-away" moldboard that rolls instead of pushes material and thus speeds up work.
- A full circle revolving blade that allows grading forward or in reverse.
- A blade held firmly on its work, through direct down pressure, for precision cutting.
- A smooth-running, economical GM 2-cycle diesel engine that packs power in every stroke.
- Complete operator comfort with full vision, responsive controls, self-energizing brakes.

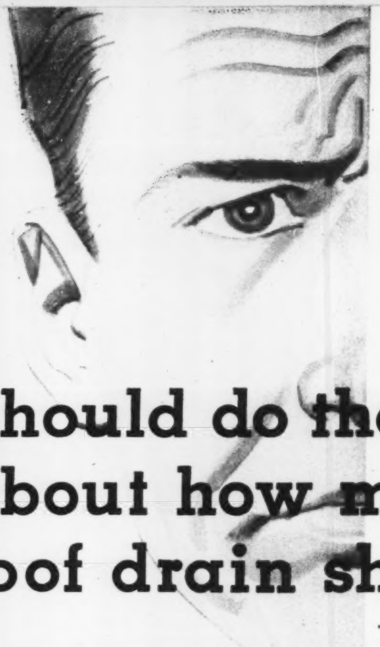
VERSATILE

FOR ALL KINDS OF USERS
FOR ALL TYPES OF
MAINTENANCE

BD-3
78 brake hp.
19,042 lbs.

BD-2
50.5 brake hp.
17,772 lbs.

W-SPEED PATROL
31.5 brake hp. • 6,000 lbs.



Who

Should do the worrying about how much water a roof drain should handle?

EVERYTHING FOR DRAINAGE SYSTEMS . . . EXCEPT THE PIPE

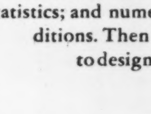
Zurn Engineers are paid by us to do just that for you. Zurn Engineers, professionally trained and enlightened by over 40 years of experience, know what is required to meet every drainage service condition in every type of modern building. For instance, Zurn Engineers perceived the need for a roof drain that would handle a larger volume of water at a faster rate. They studied and analyzed the time factor in seconds and minutes; the rate of flow and its force; air pressures; open area ratios; hydraulic head; resistances to flow; temperatures; building design and construction detail; rainfall statistics; and numerous other conditions. Then they set to work to design the Zurn Cloudburst Type Roof Drain—a drain that not only will accommodate cloudburst conditions but will do so at reduced construction costs, as compared with conventional methods.

Zurn Engineering is engaged continually in research to determine new and unusual drainage requirements common to the construction of modern types of buildings and climatic conditions. Zurn Engineering is continually developing drains of suitable type required to perform specific drainage functions. Thus do Zurn Engineers substantiate the statement that *"Zurn Provides Better Ways, to Drain Waste and Rain Water, through Research and Engineering".*

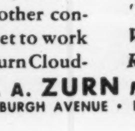
J. A. **ZURN** MFG. CO.
PITTSBURGH AVENUE • ERIE, PA., U. S. A.

ZURN Provides Better Ways,
to Drain Waste and Rain Water,
. . . through Research and Engineering

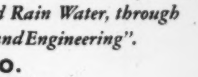
Z-506 and Z-507 Zurn Easy Level Floor Drain



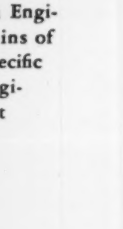
Z-542 Zurn Continuous Flow Solids Retaining Floor Drain



Z-1171 Zurn Deluxe Cast Iron Greaseptor

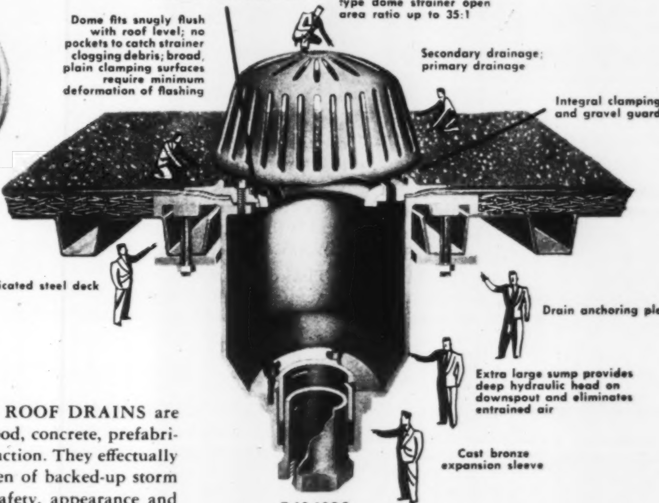


Z-1090 Zurn Backwater Sewer Valve with Cleansweep Water Ways



Z-1218 Zurn Carrier for Service Sinks

Cloudburst Type Roof Drain


Bayonet type locking device rigidly secures dome to body; easy to remove
Extra large mushroom type dome strainer open area ratio up to 35:1
Dome fits snugly flush with roof level; no pockets to catch strainer clogging debris; broad, plain clamping surfaces require minimum deformation of flashing
Secondary drainage; primary drainage
Integral clamping collar and gravel guard
Prefabricated steel deck
Drain anchoring plate
Extra large sump provides deep hydraulic head on downspout and eliminates entrained air
Cast bronze expansion sleeve

Z-12-120C

Patented & Patent Pending

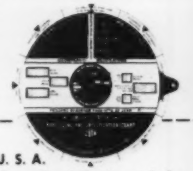
ZURN CLOUDBURST TYPE ROOF DRAINS are suitable for installation on wood, concrete, prefabricated steel deck or other roof construction. They effectually guard against the tremendous burden of backed-up storm water—a constant threat to the safety, appearance and permanence of roofing areas. The rapid flare of the dome facilitates maximum flow of water into the drain. Large, deep sump area in drain body maintains hydraulic head on downspout to compensate for pipe entrance friction factor; allows entrained air to escape. Consequently, the cloudburst type drain carries off sudden surges of water quickly and efficiently. This type drain marks a notable advancement in roof drainage—a guarantee against roof flooding with subsequent overload damage due to customary or occasional cloudburst conditions.

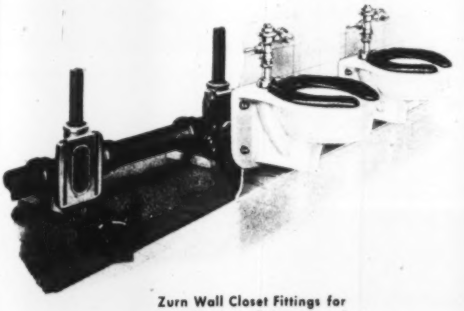
Z-150 Zurn Roof or Deck Drain for flat roofs or decks of tile, cement, concrete, pre-cast slab or other composition.

The complete line of Zurn Building, Plumbing, Drainage Products includes: **Floor and Roof Drains for every type of installation · Grease Interceptors · Oil Interceptors · Plaster and Solids Interceptors · Swimming Pool Equipment · Backwater Valves · Wall Fixture Carriers · Wall Closet Fittings · Plumbing-Drainage Fittings · Cleanouts · Bath Traps · Hydrants · Street Washers**

Zurn Draindicator Saves Time and Work

THE ZURN DRAINDICATOR was developed by Zurn Engineers as an aid to those in engineering and construction capacities. Provides the only sound engineering data on pipe line sizing, waste and storm or combined—also simplified drain selection for specific types of buildings. Although priced at $1.00 each, a supply of Draindicators has been made available for engineers and architects or plumbing contractors who may have a complimentary copy.





Zurn Wall Closet Fittings for Installation of Batteries of Wall-Type Closets.

J. A. ZURN MFG. CO., Pittsburgh Ave., Erie, Pa., U. S. A.

Please send information regarding Cloudburst Type Roof Drain and the following literature:

☐ Catalog 47-1 of Zurn Building, Plumbing, Drainage Products
☐ Zurn Draindicator
☐ Zurn Booklet on Wall Closet Fittings
☐ Zurn Handbook on the Proper Sizing and Selection of Grease Interceptors

Name .... *Position* ....
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Speeds hoisting, saves power on TIMKEN® bearings

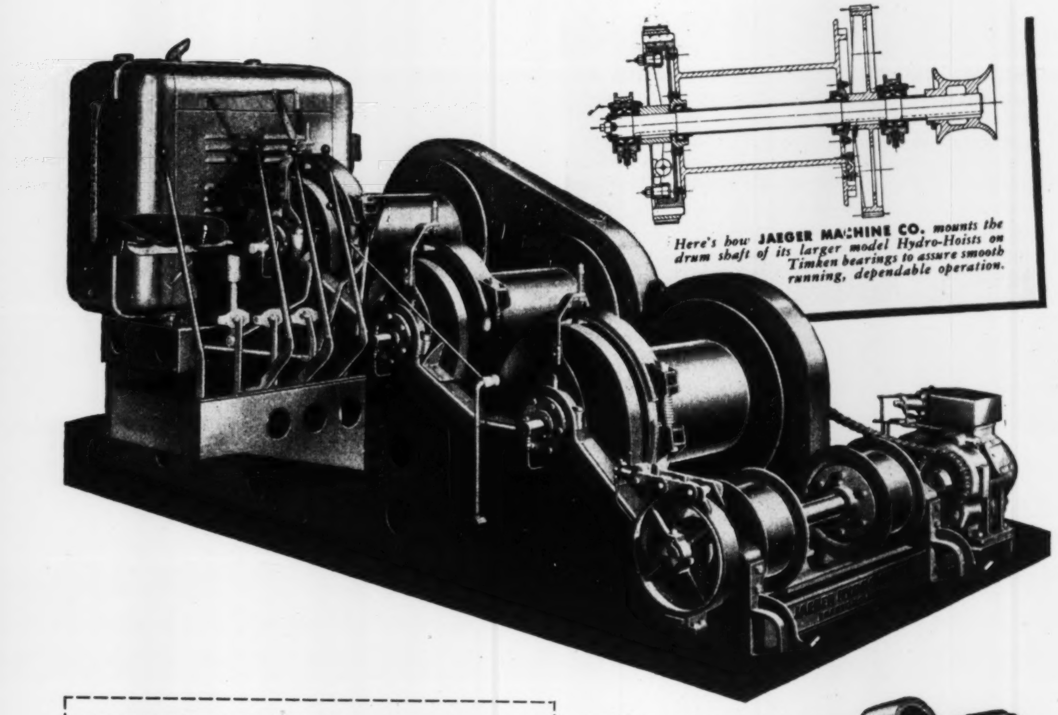
YOU can hoist loads speedily and efficiently with this Jaeger Hydro-Hoist on the job. Timken® bearings permit drums to turn freely under the heaviest loads. Loads start quickly and smoothly with no power loss due to friction.

Timken bearings keep both drums and drum shafts true-running and accurately positioned. Their tapered roller construction takes both radial and thrust loads in any combination. The line contact between the rolls and races gives tremendous load carrying capacity with negligible wear. Timken bearings normally last the life of the machine.

Timken bearings are made from the finest steel ever developed for this purpose—Timken fine alloy steel. Their true rolling motion and incredibly smooth surface finish enable them to operate freely, frictionlessly under the heaviest loads.

Timken bearings not only make better performing machines but also *better selling* machines—for Timken bearings are known and preferred the world over—wherever wheels and shafts turn. Be sure you have them in the equipment you build or buy. Look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



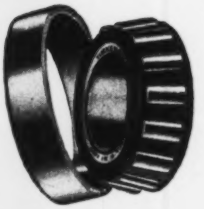
Here's how **JAEGER MACHINE CO.** *mounts the drum shaft of its larger model Hydro-Hoists on Timken bearings to assure smooth running, dependable operation.*

TIMKEN BEARING CAPACITY RATINGS INCREASED 25%

Since Timken bearings were last re-rated some 15 years ago there has been such a further and constant improvement in quality that we are now able to announce a 25% increase in radial and thrust load carrying capacity. This may make possible the use of smaller bearings with savings in bearing cost, material cost and weight. Engineers will be able to utilize the advantages of Timken bearings in more applications than in the past.

A new Timken Engineering Journal, now in preparation, will give you complete capacity rating tabulations. For further assistance, write us today.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ▯ AND THRUST ▯ LOADS OR ANY COMBINATION

What Engineers ask about

New BULL DOG V-BELTS

BWH

DEPENDABLE RUGGEDNESS

why **do new BULL DOG V-BELTS have less slippage?**

Exclusive BULL DOG CORDS are processed in a new way, which results in amazingly low stretch. As a result, there's less slippage, fewer adjustments, longer belt life.

why **do new BULL DOG V-BELTS carry heavy power loads for longer periods?**

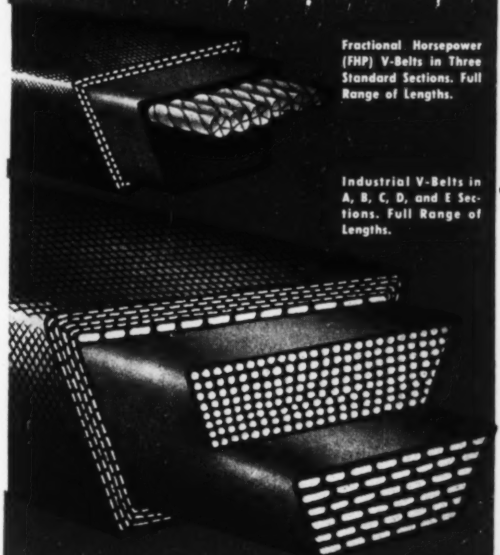
Exclusive BULL DOG CORD SECTION has higher tensile strength. This enables Bull Dog V-Belts to absorb the shock of sudden starts and stops, to run smoothly months on end.

why **do new BULL DOG V-BELTS run cool and resist flexing?**

BWH laboratories developed new quality-controlled compounds for Bull Dog V-Belts. Tests prove they run cool, don't crack or deteriorate under severe flexing.

why **do we say new BULL DOG V-BELTS have proved their dependability?**

Like all BWH products, Bull Dog V-Belts are put through the stiffest laboratory tests. But that's only the beginning! For ten years they've been given field tests under terrific hazards. Their performance proves they've got the stuff it takes for steady, trouble-free power transmission. And since their introduction in 1948, leading industries everywhere have found this newest addition to the famous BWH line fully upholds the BWH reputation for products of dependable ruggedness.



Fractional Horsepower (FHP) V-Belts in Three Standard Sections. Full Range of Lengths.

Industrial V-Belts in A, B, C, D, and E Sections. Full Range of Lengths.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

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POWER A-PLENTY

In CLEVELANDS

FOR THE **TOUGHEST** TRENCHING

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In CLEVELANDS you have smooth-flowing, reliable power directly applied without waste or loss and ample at engine working speeds well below rated capacity. This power is delivered through husky, efficient transmission units resulting in a multitude of power and speed applications to wheel and crawlers. This guarantees the correct amount of power and speed for each and every digging and operating condition to be met—accounts for CLEVELANDS high, dependable daily footage in all kinds of going. Transfer of this cushioned power, with minimum waste, is by employment of a preponderance of anti-friction bearings.

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FULL LINE . .
FULL VALUE . . .
FULL SERVICE . . . .

TAYLOR FORGE WELDELL

We have repeatedly urged users of welding fittings to accept no less than the *full line.* When we say "full line" we don't just mean its *completeness* . . . though it *is* the world's most complete line of forged steel fittings and flanges . . . and it *does* contain the widest range of types, sizes, weights and materials.

When we say "full line" we mean full value—extra value—more and better features than can be found in any other fitting.

The technical brains and forging skills which conceived these extra values continue to be available to you through the Taylor Forge organization, and through the Taylor Forge distributor who is your industrial neighbor.

Since Taylor Forge welding fittings "have everything," why compromise on less than the best?

TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS General Offices & Works: Chicago 90, Ill. (P.O. Box 485) Eastern Plant: Carnegie, Pa. Western Plant: Fontana, Calif. • District Offices—New York: 50 Church Street • Philadelphia: Broad Street Station Bldg. • Pittsburgh: First National Bank Bldg. • Chicago District Sales: 208 S. LaSalle Street • Houston: City National Bank Bldg. • Los Angeles: Subway Terminal Bldg.

Do your piping systems create any fitting or flange problems for you?. . . . .

If the information you need goes beyond the simple return of the coupon at the right, please write us fully. You will receive a prompt and detailed reply.

☐ **Who is my nearest Taylor Forge Distributor?**
☐ **Put my name on your mailing list to receive informative literature.**

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Position________________________________
Company________________________________
Street Address________________________________
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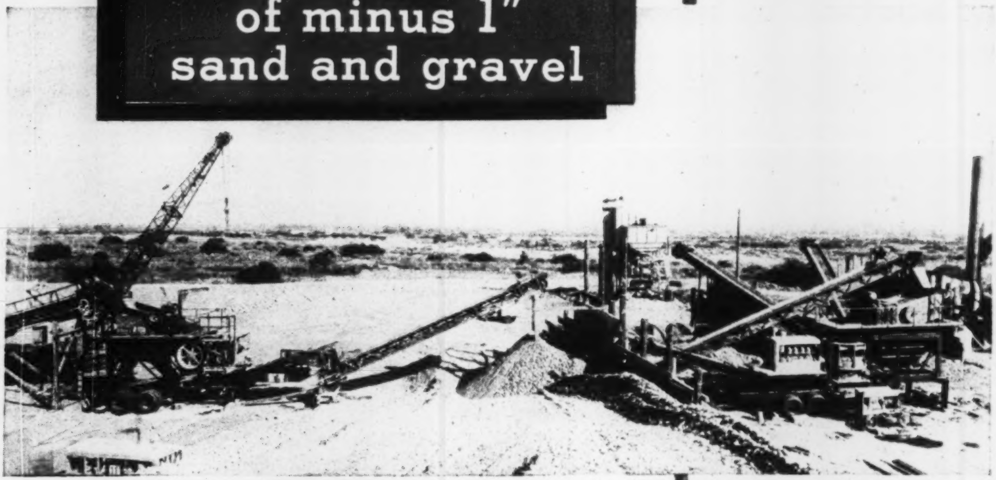
614-0349 **Mail to Taylor Forge & Pipe Works, P.O. Box 485, Chicago 90, Illinois**

Enormous Capacity of minus 1" sand and gravel

● Morrison Knudsen Co. Telsmith 2-Unit Portable Crushing-Screening Plant near Ontario, California.



TELSMITH

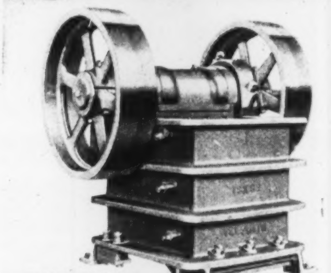
2-UNIT PORTABLE PLANT *with* Gyrasphere Secondary Crusher

● The MORRISON KNUDSEN CO. of Boise, Idaho, and California are producing about 275-300 tons per hour of minus 1-inch sand and gravel, for road building, with their Telsmith 2-Unit Portable Crushing-Screening Plant. Plant consists of . . .

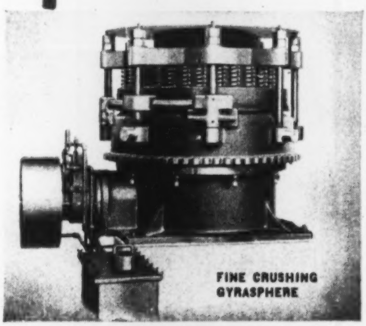
PRIMARY UNIT	SECONDARY UNIT
30" x 5'6" Plate Feeder	5' x 12' Triple Deck Sizing Screen
4' x 8' Double Deck Scalper	48" Gyrasphere Crusher
18" x 32" Roller Bearing Jaw Crusher	30" x 40' Plant Conveyor
30" x 25' Plant Conveyor	125 hp. Diesel Power Unit
105 hp. Diesel Power Unit	Five Feed and Stock-piling Conveyors

Primary Unit is taking pit run sand and gravel with 15" to 18" boulders, with the jaw crusher set at about 3". Material is then stock-piled, and fed to Secondary Unit, with Gyrasphere taking about 4" feed. Finished product goes to cement, and asphalt mixing plants. Here again, the Telsmith 2-Unit Portable Plant with Gyrasphere Crusher is giving remarkable capacities.

P-14



ROLLER BEARING
PRIMARY CRUSHER



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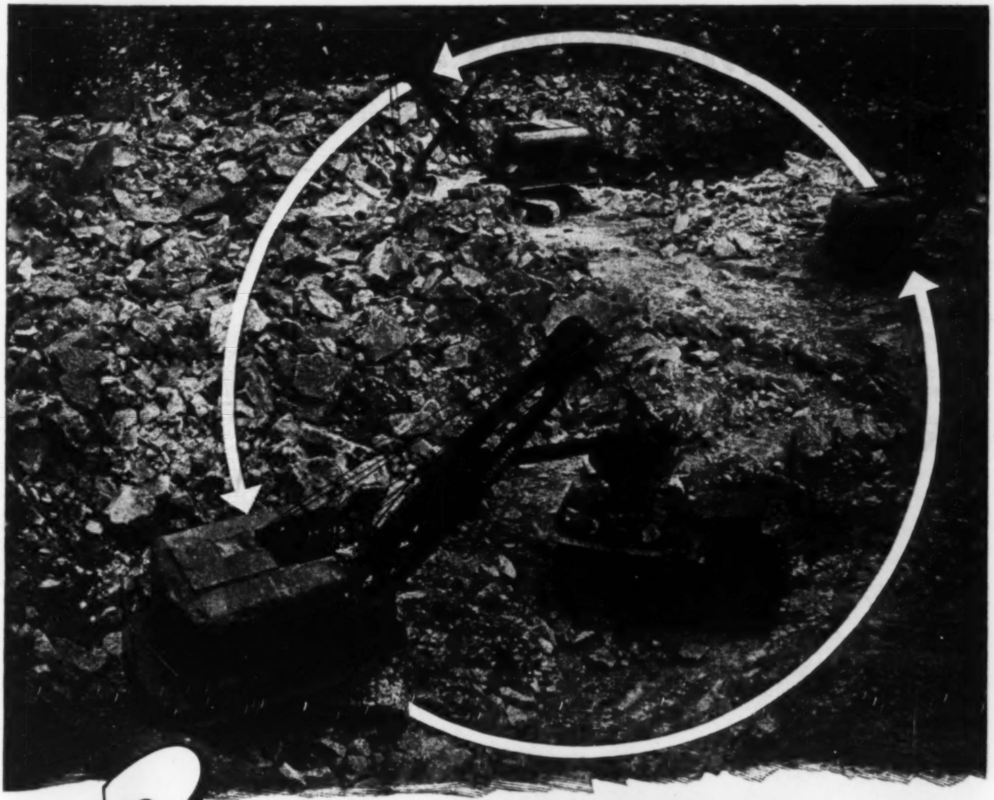

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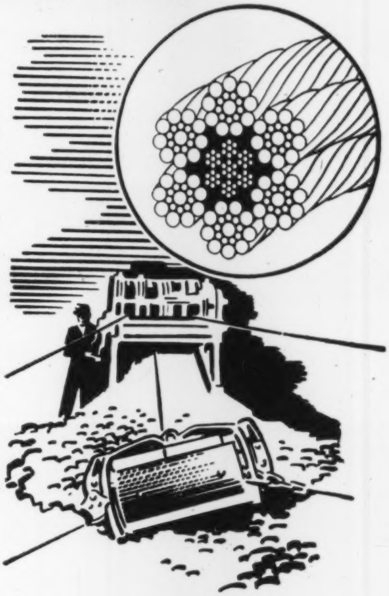
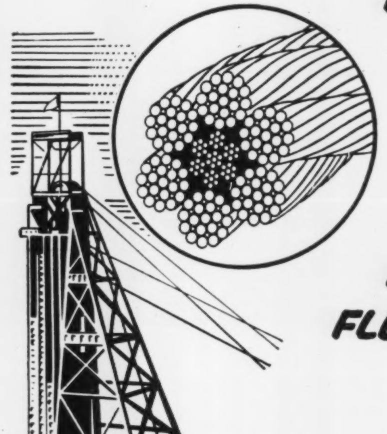


BUT...



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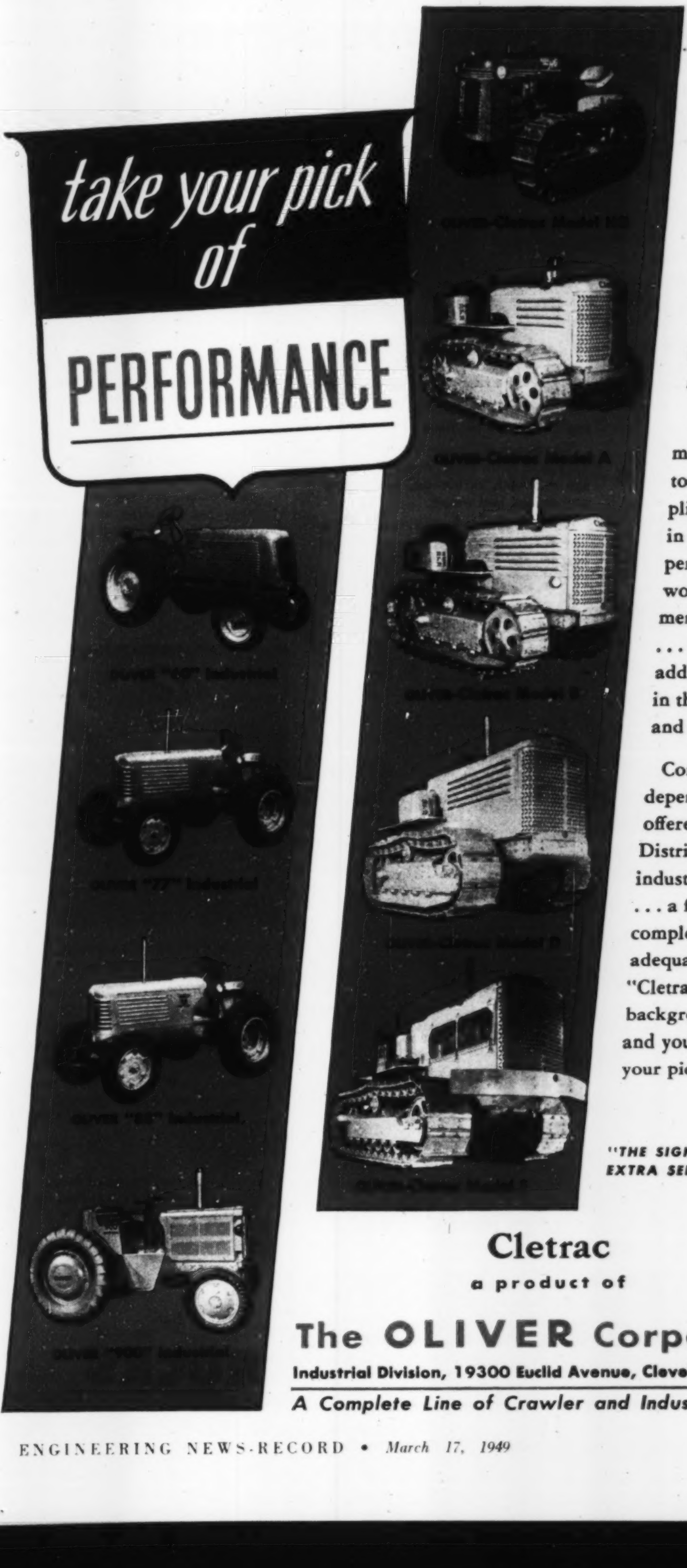
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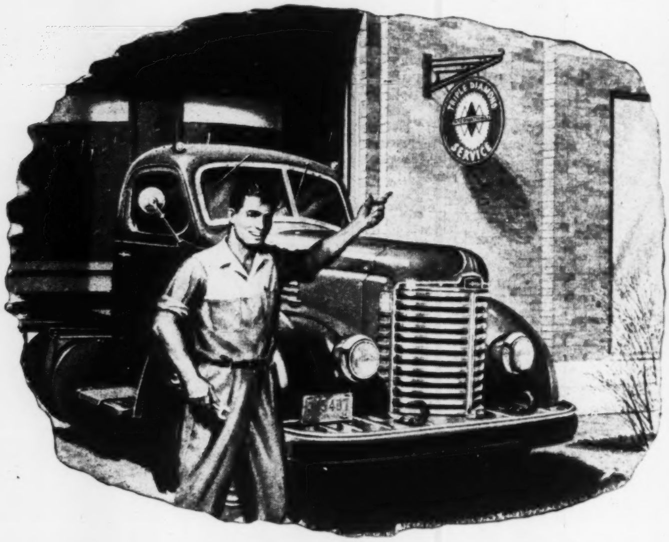

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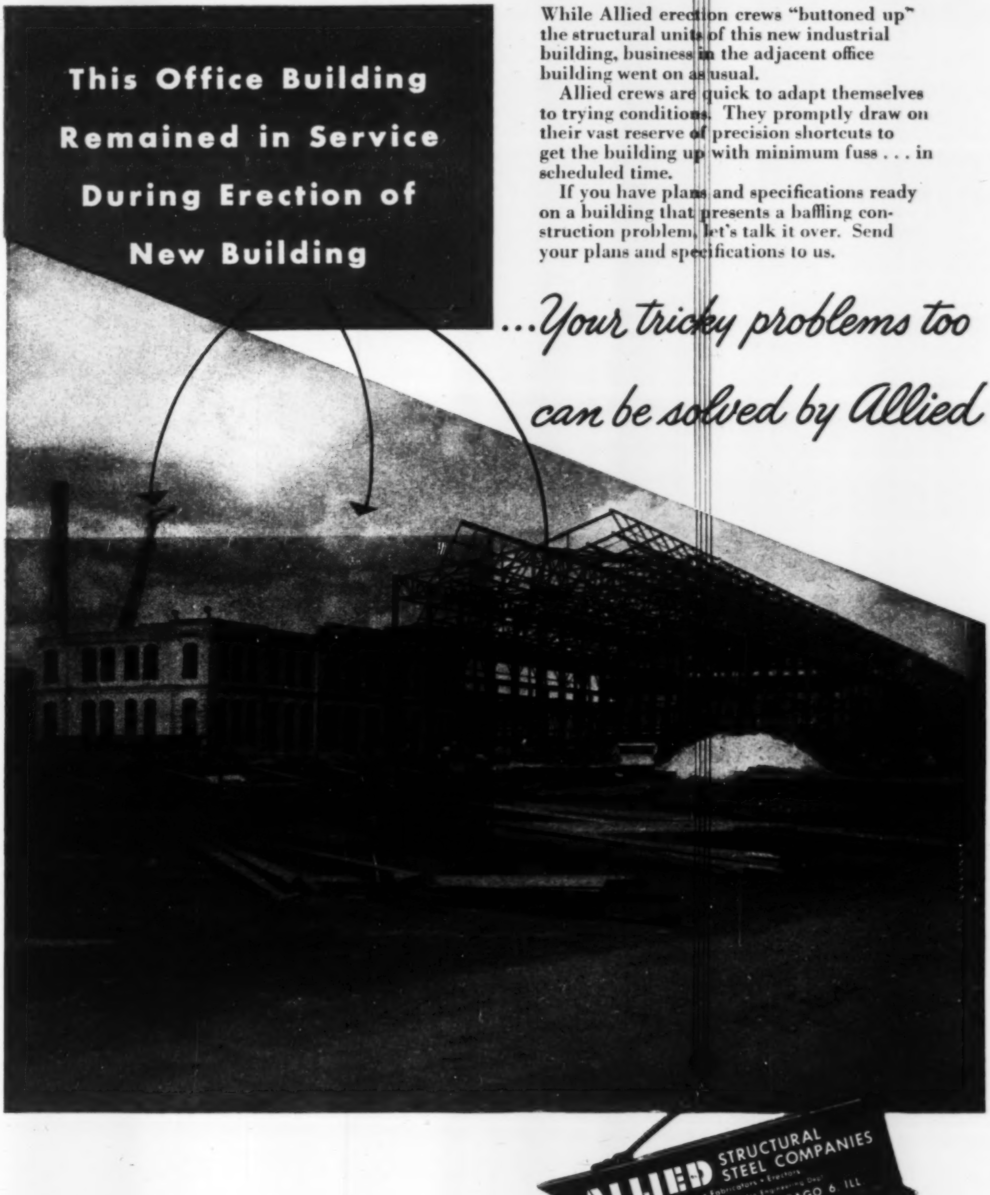

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6, 8 and 14-yd. cable scrapers for any make of track type tractor.

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MOTOR SCRAPERS BETTER NOW

Positive forced ejection and high apron lift, with the improved cable control, insures fast, complete spreading. No time wasted in jockeying apron or tail gate to eject sticky material.

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Now you can have an even better LPC Motor Scraper, improved at every point so you can be sure it will stay on the job continually — complete your job on schedule — and assure good profits!

Increase production and profits — with the new transmission, you can use *all* of the 225 H.P. to handle capacity loads, at top speeds, up and down grades, even in tough operating conditions. Figure the added profit at your own bid prices of one additional load per hour over 10,000 hours of operation. The new 32-amp. generator provides all the "juice" needed for 'round the clock operation. Bigger air compressor for greater air output and more intermittent compressor operation. Improved cable control unit and controls save valuable seconds — give accurate spreading control.

24:00 x 29 24-ply traction type tires—interchangeable front and rear. 21:00 x 29 also available.

Add these and other new and improved features to the original proven high production features and you'll see why LaPlant-Choate Motor Scrapers give you the lowest possible cost per yard — per hour — per day for the long life of the unit.

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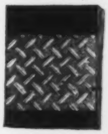

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Inland 4-WAY* SAFETY PLATE

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THE CONSTRUCTION WEEK

CODE COMPROMISES—Big stumbling block in attempts to modernize city building codes are those who hold advantages under existing rules and who can bring political pressure to bear to maintain the status quo. Example: Akron, Ohio, where a city council code committee heard lengthy complaints from labor and local contractors, then announced that "we don't want to put anybody out of business—amendments (to the proposed code) will protect all now in business."

DOUBLE-SWING—Now that financing has been finally straightened out, bids should be asked by May on the unique double swing span bridge over the York River, near Yorktown, Va. The 2,540-ft. structure will have two 500-ft. swing spans to give a 450-ft. clear channel for shipping (ENR—July1, 1948,p.9), and was chosen because the Virginia highway department thought that a high-level crossing would be visible from the Yorktown battlefield, distract tourists from historic associations of the site.

RECHECK ON HOSPITAL CUT ?—The recent pre-budget cut of 16,000 beds in the Veterans Hospital building program is very likely to be reconsidered. President Truman reportedly assured Missouri congressional delegates that a re-survey of the cut in total beds will be ordered to determine if the original order needs to be modified. Particular object of Missouri worries is a cut from 1,000 to 500 beds contemplated for a VA hospital to be built in St. Louis.

RADIANT HEATING of a pavement in Detroit to keep it free of snow costs less than originally estimated (ENR Jan. 20, p. 68). An input of 40 kwh. per hour was enough to melt a 4-in. snow fall instead of the estimated 150 kwh. to keep the 1,000-ft. test section of pavement free of ice and snow. However, in view of the fact that the installation cost $2,500 and that at this rate of consumption there just would not be enough power available to heat all main city streets in the northern states, radiant heating has not yet outmoded the snowplow.

N. Y. ON POLLUTION BANDWAGON—Governor Thomas E. Dewey took the first step to enter New York State in the pollution-control parade when he asked state legislators to approve establishment of a board to "inaugurate and enforce" a long-range water purification campaign. His request followed a two-year study by a legislative committee, which recommended among other things that such a board have the power to classify all streams. It would also be empowered to enforce abandonment of practices responsible for pollution.

TO SOLVE JET-FUEL DAMAGE—If the Air Force goes through with its present plans for burning high-octane gasoline, rather than kerosene, in jet engines, a good part of the current problem of maintaining apron pavements—especially joints in concrete surfaces—will evaporate along with the spilled gasoline.

SAVINGS ON SEWAGE—Daytona Beach, Fla., and its pocket-size new sewage disposal plant promise a surprise for sanitary engineers when the plant goes into operation soon. Using waste sludge (calcium carbonate) from the local water-softening plant as the chemical precipitant, the "Daytona Beach Process" sharply reduces BOD with only one-hour detention, and is said to make possible drastic savings in construction and operation.

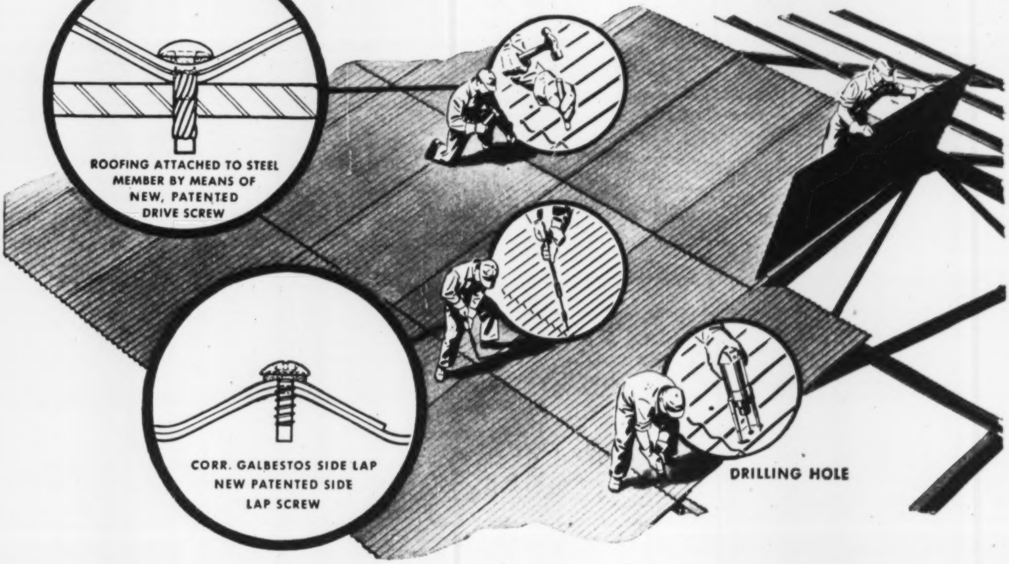
AND AGAIN — MVA—Despite President Truman's small estimate of its chances, Senator James E. Murray of Montana (with 13 colleagues) last week had dropped his pet Missouri Valley Authority proposal into the Senate hopper. Modeled after TVA, the Murray bill calls for speedy development of a basin plan; sets up a five-man board of governors and a general manager to run the authority.

STUDY TOLL ROADS—Led by Gov. Paul A. Dever and State Senator E. W. Staves, Massachusetts legislators are showing interest in construction of toll roads—particularly for connections between the Connecticut border and metropolitan Boston. Sen. Staves contends toll roads are the only means by which the state can finance the $700 million it will need for highway construction over the next few years.

PLUMBING CODE CONFLICT ? — While the Housing and Home Finance Agency was announcing plans for a meeting this month to discuss a national plumbing code, the American Society of Mechanical Engineers last week announced publication of American Standard Plumbing Code ASA-A40. 7-1949. The ASME code—sponsored jointly by the American Public Health Association —poses the likelihood of further delay in general adoption, should HHFA succeed in grinding out a code of its own.

SAME NUMBER OF MEN . . . SAME AMOUNT OF TIME . . .

BUT . . . TWICE AS MUCH DONE


ROOFING ATTACHED TO STEEL MEMBER BY MEANS OF NEW, PATENTED DRIVE SCREW
CORR. GALBESTOS SIDE LAP NEW PATENTED SIDE LAP SCREW
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The asbestos is impregnated with asphalt, then waterproofed. Galbestos has been proved on installations all over the world to outlast any comparable material under the most grueling weather and industrial heat and corrosion. It virtually eliminates maintenance, which is actually continuation of first cost.

Galbestos comes in standard roofing and siding sheets up to 12 ft. long; maroon or black; flat or in several corrugations; for use over steel skeleton framework. Galbestos cuts cost of new building by saving large amounts of structural steel and other materials. It needs fewer purlins, less foundation.

Galbestos has been tested and classified by the Underwriters' Laboratories, Inc. and Assoc. Factory Mutuals Ins. Co's.

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Your own men can use Top-Speed Fastening*, a new method of attaching roofing and siding to steel frame. It's the first genuine means of cutting cost that has come out of the postwar.

Top-Speed Fastening uses a group of newly invented tools. But they're simple. And cheap. The system eliminates all interior scaffolding. So much time is saved that the same number of men in the same time can apply twice as much material.

That's big saving—and it's equally good on new construction or on repairs.

Now, here's another slant: Top-Speed Insulation* is a new method of applying insulation entirely from outside, before the sheeting is laid in place, again eliminating all interior scaffolding.

IF YOU USE TOP-SPEED FASTENING, THE TIME SAVED IS SO GREAT IT PAYS FOR THE LABOR NEEDED TO INSULATE. Therefore, you can, if you want, insulate merely for the cost of the material. Building Cost = Time + Materials. The only way to cut cost is to cut time or materials.

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EDITORIALS

Building Research

Much promise for better building rests in the recent organization of a Building Research Advisory Board under the National Research Council. In none of the various phases of construction is there such a need for promotion and coordination of research as in that commonly referred to as building, which includes everything from houses to skyscrapers. And in none is effective research more difficult. Whereas dams, bridges, hydraulic structures, even roads, are the responsibilities of a relatively few organizations, buildings involve a veritable army of interests. It is because of this great diversity that an organization of the BRAB type seems to offer so much promise. Supported by all these interests—material and product manufacturers, architects, engineers, government and builders—it can command respect and develop authority. Set up under the National Research Council pattern, it has also the experience of other groups, such as the very effective Highway Research Board, to guide it. Not organized to do research itself, but dedicated to the stimulation and coordination of research efforts, it can exert effective leadership. One requirement that BRAB will have, which few other similar groups must face, is that of getting the results of building research utilized. In other fields research results are put to work immediately. In the building field, the user must be convinced of their usefulness, and his aid must often be enlisted to overcome building code restrictions. The success with which BRAB operates will largely be measured by the degree to which its reports are put to work.

New Berth for PRA

The Hoover Commission in its latest report on government reorganization has recommended that the Public Roads Administration be transferred to a new division of transportation service in the Department of Commerce. So long as the PRA is kept intact, in organizational setup and policy, there would seem to be no particular disadvantage to this new berth; PRA has gone through previous transfers without harm. There is, too, an obvious logic in bringing under one tent as large a number as possible of federal agencies that relate to transport. The Commerce transportation service would include the Civil Aeronautics Administration, the Maritime Commission, the Coast Guard and part of the Interstate Commerce Commission. In so far as the PRA is concerned, it could function in such an atmosphere with the same efficiency as it has in the Federal Works Agency, or did previously in the Department of Agriculture.

The Hoover Commission recommendation is significant in another respect. It deflates the rumor that a huge public works department is going to be recommended in which roads, airports, buildings, dams and all other civil engineering activities would be concentrated. The exemption of highways and airports is a good move. In the first place the federal government is not engaged directly in their construction, but merely makes grants-in-aid to the states and cities. And in the second place, too much concentration can be as harmful as too little.

Centralized Transportation Planning

A transportation service division within the Commerce Department, as proposed by the Hoover Commission, has much to commend it, and seems to be a better plan than to set up a separate Department of Transportation headed by a Secretary of Transportation, as was proposed by one of the Hoover Commission "task forces." Under the present set-up, national planning for highways is in the Federal Works Agency, railway planning is a function of the Interstate Commerce Commission, recommendations as to where inland waterways are to be built is a responsibility of the Army Engineers, and decisions as to where airports should be built rests with the Civil Aeronautics Administration, which is now in the Department of Commerce. There can be no logical over-all thinking about transportation under such an arrangement.

St. Lawrence Ups and Downs

Action on the application of the Power Authority of the State of New York for permission to proceed with development of power in the international section of the St. Lawrence River in cooperation with the Hydro-Electric Power Commission of Ontario has been postponed by the Federal Power Commission. This is due to pending reconsideration by Congress of the 1941 agreement covering both power and the seaway. Unfortunately, withholding a permit can only result in further delay in getting engineering plans advanced to the point where construction can get under way quickly once the two countries reach an agreement. On the other hand, the M. & A. Hanna Company of Cleveland, one of the large ore and coal handlers on the Great Lakes and a long-time opponent of the St. Lawrence seaway, has come out in favor of the project as a means for bringing iron ore from Labrador and Quebec up into the Great Lakes. Such support from so influential an organization may well mean that when the seaway and power project does come up in Congress there will be little opposition.

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at no extra cost

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. . . Makes better concrete block. Produces "rubbery" mix that holds together better. Withstands rougher handling. Reduces cracking, breakage, culls and throwbacks. Improves face and edge appearance. Generally increases strength.

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. . . Produces concrete that handles, spreads, screeds and finishes more easily. Calls for no additional materials—merely the same care and good workmanship regularly employed.

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ENGINEERING NEWS-RECORD

MARCH 17, 1949 VOL. 142 NO. 11

Hoover report urges transfer of Army river engineering

Commission recommends Army civil works be turned over to Interior Department, along with reclamation, hydropower—Members file dissenting report, opposing transfer

The Hoover Commission March 17th submitted a report to Congress recommending that river development functions of the Corps of Engineers be transferred to another department of the government.

As part of its report on reorganization of the Interior Department, the commission advocated putting Army civil works in an integrated river development service, with reclamation and related hydro-power functions.

(A complete study of the Hoover report, and of the individual reports of the two task committees that did the spadework for the commission as a whole, will appear in these columns in the March 24 issue.)

The report shows plainly that the commission wrestled with a bear in making its decisions on reorganization of federal public works and natural resources activities. Two commissioners signed a strong dissent opposing any tampering with the flood control or rivers and harbors functions of the Army engineers. Three other members put together a separate minority report urging—instead of Interior—a new Department of Natural Resources, charged with the single broad responsibility of conserving and developing all resources, both land and water.

Four major responsibilities

Thus, of the twelve commission members, nine may be said to support the majority report—some of them with reservations, of which the dissent on Army civil functions is the most important. The majority recommends reorganizing the Interior Department to comprise four principal services: (1) Water development and use, (2) building construction, (3) mineral resources, and (4) recreation. Projects proposed by these services—after approval by the Secretary of Interior—would go for review to a board of impartial analysis in the office of the President.

The minority report differs fundamentally from this proposal. In the view of the three minority commissioners, a new department should be created to pull together all activities concerned with conservation and development of land and water resources. This department would take in land resource activities assigned to Agriculture by the majority report and would exclude building construction as extraneous to the purpose of a natural resources agency. The minority agrees that a board of review should be set up in the President's office to screen projects submitted.

Like the other 14 reports being sent to Congress by the Hoover Commission, the Interior Department report cannot become the basis of action until Congress gives the President authority to propose reorganization plans. Those plans then would be subject to Congressional veto.

From what has happened to authorizing legislation now before Congress, it is pretty obvious that the present session will block any proposal to take river development functions away from the Corps of Engineers. The House has passed a bill empowering the President to prepare and submit a reorganization plan, but this bill excludes several agencies—the national military establishment among them—from any general reorganization proposal (ENR, Feb. 17, p. 45).

The House-passed measure was referred in the Senate to the Committee on Expenditures in the Executive Departments, which has concluded hearings on the bill. This committee is headed by Sen. John L. McClellan of Arkansas, who also is a member of the Hoover Commission. Unalterably opposed to any transfer of Army civil functions, he is one of the two commissioners who joined in the potent dissent on that particular feature of the Interior Department report.

Within a week, his Senate committee hopes to report its version of the reorganization bill. The committee wants to submit a clean-cut bill—free from any exemptions, if possible, but the chairman and most of the members want to word the measure in such a way that no transfer of Army civil functions could get by this Congress. Giving either house power to veto a Presidential proposal may be the answer; Senator McClellan is sure the Senate would defeat any plan to shift the river development activities of the Corps of Engineers to any other agency.

Two court rulings affect foreign jobs

Contractors who do government work outside the continental United States had two decisions of the U. S. Supreme Court to guide them this week as to applicability of federal laws governing wages and hours. The court:

1. Held that the eight-hour-day law covering public construction does not apply to American citizens hired to work on a government contract job in a foreign country.

2. Refused to reconsider its decision of Dec. 6 which held that military bases leased from foreign countries are U. S. "possessions" for the purposes of administering the Fair Labor Standards (Wage-Hour) Act (ENR Mar. 3, p. 25).

The Wage-Hour Law case involved Americans employed by Vermilya-Brown Co. at a base in Bermuda which the United States has leased from Great Britain for 99 years. In asking for reconsideration of this decision, the various government agencies footing the bills asserted that higher labor costs resulting from the decision will "doubtless run into the hundreds of millions" of dollars. The court split, 5-4.

The Supreme Court was unanimous in denying a suit for daily overtime pay by a cook employed by Foley Bros., Inc., on government work in Iran and Iraq in 1942 and 1943. New York State courts had awarded the cook $3,328. The Supreme Court upheld the view of the government that the eight-hour law was never intended to apply to work abroad.

NEWS BRIEFS

Memorials—Allen County commissioners at FORT WAYNE, IND., hope to be able to accept bids this spring on the $3,000,000 War Memorial Coliseum . . . R. P. Weatherford, Jr., Kansas City, Mo., is architect for the proposed Truman Memorial at INDEPENDENCE, MO. . . . Vanderbilt University, NASHVILLE, TENN., will begin construction of the $1,500,000 memorial gymnasium-field house about June 1.

Power Projects—Boston Edison Co., BOSTON, MASS., plans to spend $78,000,000 in new construction during the next five years . . . Duke Power Co. is to build a $20,000,000 steam-electric generating plant on the Saluda River 17 miles southwest of GREENVILLE, S. C. . . . Cost estimates totalling about $22,200,000 have been prepared for two entirely new electric generating plants for the Niagara Hudson Power Corp. system in upstate NEW YORK.

Dams—Work has been resumed on the Harlan County Dam in NEBRASKA. . . . Construction of the $62,000,000 Wolf Creek Dam in KENTUCKY has been delayed by bad weather and high water, Col. H. V. Canan, district engineer of the Corps of Engineers reports. . . . MOBILE, ALA. office of the Corps of Engineers has released plans and specifications on the construction of a lock and fixed crest spillway for the $30,000,000 Jim Woodruff Dam on the Apalachilcola River near CHATTAHOOCHEE, FLA. Bids are asked for April 15.

Housing—At QUEBEC, QUE., a municipal housing project exceeding $25,000,000 is planned for this year . . . Forty-five builders in FORT WORTH, TEX., estimate that more than 4,000 homes to sell for under $8,000 may be built in that city this year . . . N. Y. CITY housing authority has taken bids for the Sedgwick Houses to occupy a 7-ac. site in the Bronx to provide 786 apartments . . . Maurice Krull has started work on the $5,000,000 Deepwater Village subdivision near PASADENA, TEX. . . . Plans are under way to spend $1,360,000 on 172 new units in the Lafayette Shores area of NORFOLK, VA. . . . Aberthaw Co., Boston, Mass., has started Harvard University's housing project for faculty families and veterans at CAMBRIDGE, MASS. . . . If approved by the state, the Mutual Benefit Health and Accident Association will underwrite the $6,000,000 housing project planned for an area bounded by 36th, 40th, Lake and Blondo Sts., OMAHA, NEB. . . . John J. Coleman, chairman of the Boston, Mass., housing authority, says bids will be asked in 60 days for two veterans' housing projects in the BRIGHTON section—648 family units in 3-story and 6-story apartment buildings.

(Continued on p. 266)

◆

New railroad to shorten Chicago-Kansas City run

The Chicago, Burlington & Quincy Railroad plans to shorten its Chicago-Kansas City, Mo., main line 23 miles by constructing a new 45 mile road. This new section would be known as the Kansas City & Brookfield.

Wabash tracks would be used for 12½ miles from Birmingham to Missouri City Junction; then the new railroad would stretch 45¼ miles northeast to Tina Junction. From there the Burlington's existing Carrollton branch would be used to Forkner, and a new seven-mile cutoff would join Forkner with the present main line at Brookfield.

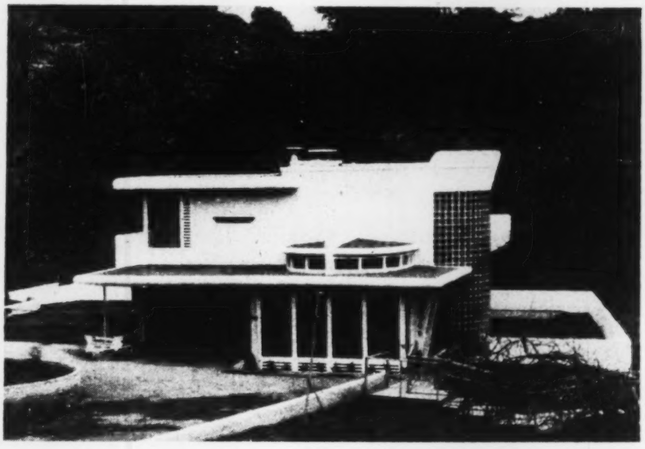
Totaling 86 miles, the new route would save 2½ to 3 hours in running time of night passenger trains between Chicago and Kansas City. Operation of two day-time "Zephyrs" would also be permitted by use of this short cut.

FWA Commissioner Field succeeded by P. F. Seward

George H. Field, Commissioner of the Bureau of Community Facilities in the Federal Works Agency, has resigned as of March 4 to join the Dahlman Construction Co., Milwaukee, Wis. To succeed him, Maj. Gen. Philip B. Fleming, Federal Works Administrator, has appointed Pere F. Seward, deputy commissioner for engineering in the Bureau of Community Facilities.

Mr. Field has been head of the bureau since it was established in 1945. Of the activities that he administered during that time, one of the most important was the advance planning program, discontinued by the Congress last year. While in effect, the program approved more than 7,000 applications for Federal aid in the preparing of plans and specifications for local public works, with the objective of building up a reservoir of projects ready to go in case of a construction slump.

Mr. Seward, before assignment to the bureau, was director of the projects division in the office of the Federal Works administrator during World War II. Previously he had been an engineer examiner and director in the projects division of the Federal Emergency Administration of Public Works. After serving in World War I, he was associated with the Maryland and North Carolina highway commissions.



PUSH BUTTON PARADISE—"Rendezview" is a super-modern home in San Rafael, Calif., said to worth $75,000. Owned, designed and built by Arnold H. Forsman, the structure is packed with electrically controlled gadgets. For radiant heating, there are water pipes above concrete floor slabs and beneath wood flooring. Aluminum foil below pipe reflects heat upward, and a five-hour saving in heating time is claimed. (Wide World Photo)

PRA shifts to Commerce Department under new reorganization proposal

Hoover Commission reorganization would create transportation service in department to include PRA, CAA and ICC functions

Proposed reorganization of the Commerce Department by the Hoover Commission would entail setting up in the department two new divisions—a transportation service and an industrial and commercial service. The transportation service would have charge of all the government's transportation activities—highway, marine and civil aviation—according to the report made last week to Congress on the Commerce Department.

Under the plan, the Public Roads Administration would be transferred from the Federal Works Agency to the proposed transportation service of the Commerce Department. This recommendation would indicate that other FWA functions—such as the Public Buildings Administration—would be assigned to existing government departments in the overall coordination scheme of the Commission on Organization of the Executive Branch of the Government (the Hoover Commission.) The Commission's suggestion can be carried out only with the authority of Congress, not yet spelled out in any final legislative bill.

Coordination needed

The commission stated that transportation activities now are scattered over many separate agencies, with consequent waste and overlap. Further, it said, there is no coordination of government policies in the transportation field. The report attempts to pull together in the Department of Commerce the government's varied interests in transportation, as Congress intended when it originally created the department. This proposal, however, excluded all regulatory functions, which the commission said ought to be divorced from operation.

On highway transportation, in addition to PRA, the commission recommended that motor-carrier safety functions—highly technical in nature—be transferred from the Interstate Commerce Commission to the proposed new setup in the Commerce Department. The report suggested no change in the present functions of PRA as an operating entity.

The commission report proposed that the present activities of the Civil Aeronautics Administration—including federal aid to airports—remain in the Commerce Department. These and other functions would be carried out by a suggested bureau of civil aviation under the transportation service. The bureau would also take in the National Advisory Committee for Aeronautics—though one commission member dissented from this suggestion.

Route regulation

On the planning of route patterns for transportation, the commission recommended that the Secretary of Commerce have the duty of making overall route programs for air, land and water. Up to the present, the report declared, route patterns have been determined haphazardly upon a case-by-case basis by regulatory agencies. Routes, it said, should be planned with careful consideration for the total transportation needs of the country and the areas to be served. For example, air route planning should be coordinated with airway and airport development programs.

For railroad transportation, the commission recommended a bureau in the proposed transportation service to take over two present ICC functions: to formulate railroad-consolidation plans and to deal with car service and safety.

The Coast and Geodetic Survey would remain in commerce as part of the navigation aids bureau.

Separate recommendations on the Inland Waterways Corp. will be made in its report on business enterprises of the government, the Hoover Commission promised in its commerce document.

Activities of the Weather Bureau, the commission suggested, should be coordinated with the proposed transportation service in a manner to be determined by the Secretary of Commerce. The Weather Bureau is now an agency of the department.

N. Y. professional engineers back state building code

The New York State Society of Professional Engineers has given its backing to Governor Dewey's plan for a mandatory statewide building code. (ENR Feb. 10, p. 15).

In Albany for their annual midwinter meeting last week, the society approved a commitee report favoring the governor's proposal to reduce housing costs by permitting use of new materials and new construction methods. The plan would require cities to permit any construction that complied with the state code.

Ellis L. Lavine, New York City, chairman of the society's committee on housing and codes, said the adoption of statewide minimum standards would result in more and cheaper housing by bypassing the "antiquated restrictions" of many cities in the state.

The committee took issue, however, with the governor's proposal to have the new code drawn up by a full-time commission. The committee recommended an 11-member commission, only three of whom would be employed full time and all of whom should be professional engineers or registered architects. On March 2 Governor Dewey, in a special message, urged the Legislature to adopt the Fino-McCullough bill creating a State Building Commission.

Mr. Lavine said the commission should begin work first on a code for one-and two-family houses, leaving standards for other types of construction until later.

The engineers also urged Congress to retain provisions of the Taft-Hartley Law exempting professional employes from blanket coverage in labor agreements.

◆

Officers named by ASBO at San Antonio meeting

At a meeting of the Coordinating Council of the American Society of Building Officials at San Antonio, Tex., a full slate of officers were named to head the group during its first year of formal operation.

The meeting was held for the purpose of electing officers and developing a constitution and by-laws for the organization. ASBO was formed by the Pacific Coast Building Officials Conference and the Building Officials Conference of America to provide an overall organization to act as a coordinating council for all building officials organizations in the United States of more than state-wide scope.

The following officers were named: president, Gilbert E. Morris, superintendent of the Department of Building and Safety, Los Angeles, Calif.; first vice-president, Walker S. Lee, superintendent of building, Rochester, N. Y.; second vice president, Harold O. Rasmussen, chief building inspector, Santa Ana, Calif.; secretary, Hal Colling, managing secretary, Pacific Coast Building Officials Conference, Los Angeles, Calif.

BETTER ROADS FOR MEXICO—Latest IRF affiliate, Mexican Road Association celebrates its formation with a dinner at which Jose Rivera, its new director general, spoke. Others at the table (l. to r.) are Romulo O'Farrill, president of the Mexican group; Garcia Lopez, Mexican minister of communications and public works; J. H. Sembower, executive director, IRF; and M. C. McIntyre, General Motors of Mexico.

IRF reports on foreign road promotion

Since its organization last July, the International Road Federation, which was formed and financed by leading oil, automobile and rubber companies, has had an interest in raising living standards abroad through the development of better roads (ENR July 22, 1948, p 42).

It has been instrumental in organizing or securing affiliation with national highway groups in eight countries. These are: France, Switzerland, England, Sweden, the Netherlands, Uruguay, Brazil and Mexico. Working parties have also been formed in Peru, Chile and Argentina looking toward organizations there, and negotiations are underway in New Zealand, Australia, the Philippines, South Africa, Pakistan and India. A near-miss was scored in Venezuela when the revolution interrupted a plan that was almost complete. A Belgium federation will be dedicated in the next few weeks.

Mexico joins up

The latest success of the IRF was recorded in Mexico last month with the formation of the Mexican Road Association. Composed of businessmen in that country, it has the backing of the federal government and of President Aleman who took a prominent part in the dedication ceremonies. Jose Rivera is director general of the Mexican group (ENR Mar. 10, p. 35).

With a nucleus of a dozen or more federations in various parts of the world, the second phase of the IRF plan—distribution to these federations of authoritative information from U. S. road planning, construction and research groups—will begin. This reporting system will also facilitate interchange of data from each of the member countries among the federated groups.

◆

ECA seeks U. S. geologists, engineers for Britain

Nearly 60 geodetic engineers, geologists and chemist-assayers will be recruited in the United States to speed surveys that have been moving slowly in certain British colonial areas—in Africa, Borneo and British Guiana—the Economic Cooperation Administration announced recently. ECA has earmarked $1,500,000 to pay salaries of survey personnel and has made an agreement with the United Kingdom to release up to 420,000 pounds sterling – about $1,680,000 – from the counterpart fund to take care of other expenses.

The U. S. geological survey will act as recruiting agent for ECA in signing up 19 geologists, three petrologists and three chemist-assayers for a period of three years. Arrangements are being made with USGS and the Army map service to recruit 24 to 30 geodetic engineers, but it may take several weeks to put this plan into operation. Meanwhile, inquiries can best be directed to Evan Just, chief of the division of strategic materials, ECA, Washington 25, D. C.

Trained geodetic engineers are needed to make basic control surveys for topographic air mapping in Africa. The men will be attached to the colonial survey now engaged in photographing and mapping large parts of Uganda, Kenya, Northern Rhodesia, Nyasaland and Tanganyika.

Geologists recruited here will be assigned to surveys now in progress in Africa and other British colonial areas, including Nigeria, the Gold Coast, Sierra Leone, Uganda, Kenya, Tanganyika, Borneo and British Guiana. Of the long list of minerals now produced or known to exist in these colonies, a number could be developed to relieve present shortages and assist European recovery.

Trained personnel of the kind required for the survey projects is limited in number. ECA does not know whether the full complement of men can be obtained. Progress of the surveys—started in 1946—has been delayed by a personnel shortage resulting from war-time interruption of technical training programs in Britain.

◆

Herbert S. Crocker dies; former ASCE president

Herbert Samuel Crocker, 81, former president of the American Society of Civil Engineers (1932) and an honorary member of the society since 1940, died March 8 at his home in Denver, Colo.

A native of Haverhill, N. H., Col. Crocker took his engineering degree from the University of Michigan in 1889, and began his long engineering career as a draftsman with the bridge department of the Chicago, Milwaukee and St. Paul Ry. He continued in railway engineering with this and other railroads until 1896.

Commissioned a major (and later lieutenant-colonel) of engineers in 1917, Col. Crocker was assigned to the Army base in Brooklyn, N. Y., as construction quartermaster, and while serving in this capacity he directed construction of what was then the largest concrete building ever built—the $32,000,000 Army installation.

He served as acting secretary of the ASCE for a brief period in 1920-21, and then returned to Denver to enter private practice, devoting himself largely to structural, irrigation and water supply problems. He also designed the administration building at the Denver airport; was a partner in a contracting firm building highways and bridges in the Rocky Mountain West; and served as a member of the Mississippi Valley Commission and many other public bodies.

Preload Corp. opens suit against Pacific Bridge Co.

Preload Corp., of New York City, and Preload Enterprises, Inc., Delaware subsidiary, have filed suit for $1,500,000 damages against the Pacific Bridge Co. of San Francisco in the U. S. District Court of Delaware at Wilmington, alleging infringements of nine patents.

Preload Enterprises and Preload Corp., designers and builders of prestressed concrete structures, said in their bill of complaint that they had used for a number of years the trade name "Preload," and with it a certain characteristic design.

Claiming trade mark infringement, the plaintiff alleged that the Pacific Bridge Co. "has for a long time past and is still utilizing the trade name 'Preload' and trademark 400,513 in its advertising, and in connection with its manufacture, use and sale of prestressed concrete structures of the type designed and built by the plaintiff, all without license or permission by the plaintiff."

The complaint also charges that the defendant company "has appropriated designs for prestressed concrete structures prepared by the plaintiffs," appropriated avertising, advertising pictures and literature of the plaintiffs, prevented plaintiffs' licensee, the Preload Pacific Corp., a Nevada corporation, from bidding on prestressed concrete structures, entered bids for itself on such structures using plaintiffs' designs and advertising, accepted such bids, and built and sold such structures."

As it has just recently received the bill of complaint, the Pacific Bridge Co. has no comment at this time.

Pacific Bridge Co. used the Preload system first on a water tank for the city of Grand Coulee, Wash., and it is curently using it on 18 large digesters at the Hyperion sewage plant at Los Angeles, Calif.

◆

USBR asks bids April 1 on North Dam, Washington

A call for bids has been issued recently by the Bureau of Reclamation for construction of the 1,400-ft. North Dam and equalizing reservoir of the Columbia Basin irrigation project. Completion of 9,500 ft. of the feeder canal which will carry water to the reservoir from the Grand Coulee dam pumping plant is also included.

North Dam will contain about 1,235,000 cu.yd. of earth and rock and will have a maximum height of 145 ft. above lowest bedrock. Specifications call for 1,650,000 cu.yd. of excavation, 54,000 cu.yd. of concrete and furnishing and placing 7,000,000 lb. of reinforcing steel. Bids will be opened at Grand Coulee Dam April 1.

North Dam is the fourth to be built in the Columbia Basin project. Long Lake Dam is completed and the 3½ mile O'Sullivan Dam and the 10,000-ft. South Dam completed this summer.

◆

OK development plan for Pacific Northwest

An initial development program, covering first steps in long-range construction plans involving expenditure of $2.5 billion in the Pacific Northwest was approved by the Columbia Basin Inter-agency Committee meeting at Portland, Ore., late last month.

With a view to co-ordinating objectives of state and federal agencies, the committee listed an eight-point, six-year program for development of resources in the area. These objectives were named:

(1) Adequate water supplies for domestic, industrial and irrigation purposes. (2) Soil conservation and new land cultivation, including irrigation, in the interest of the nation's food supply. (3) Watershed conservation by placing forests and grazing lands largely on sustained-yield basis. (4) Reduction of flood damages to nominal amounts. (5) Additional hydroelectric development to produce sufficient power to keep abreast of present and potential economic growth of the region, and to ease pressure on the nation's fuel reserves. (6) Navigation development on the Columbia, Snake and Willamette rivers. (7) Conservation and enhancement of fish and wild life. (8) Fostering recreational, park and related facilities.

This program was presented by the committee as a summation of proposals by the principal federal agencies and states concerned. The committee will meet with the Idaho State Reclamation Association at Boise March 24.

◆

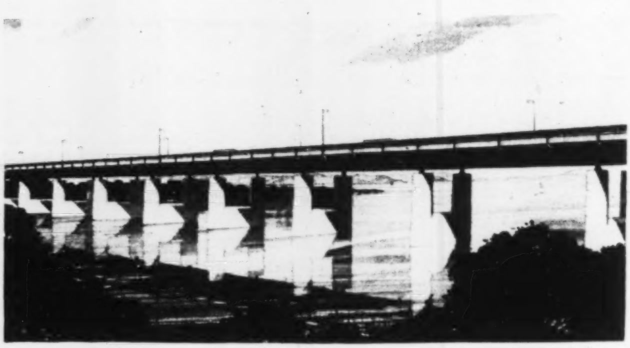
Tacoma power project to require FPC license

Construction by Tacoma, Wash., of its proposed water power project on the Cowlitz River will require a license, the Federal Power Commission announced last week. The finding was based on the fact that the project would affect public lands or reservations of the United States, as well as the interests of interstate commerce.

Tacoma, through its light division, Department of Public Utilities, last August filed a declaration of intention to construct the project and followed it with an application for license in December.

Project plans call for one 350-ft. high dam, near the town of Mossy Rock, and a 225-ft. dam in the vicinity of Mayfield. The Mossy Rock dam, to create a reservoir with a storage capacity of 1,375,000 acre-ft., would have a powerhouse with an installed capacity of 225,000 kw. in three units. The Mayfield reservoir, with a storage capacity of about 127,000 acre-ft., would operate three generating units with a total capacity of 120,000 kw.

NOAH HAD HIS ARK—Floods have not changed much, but emergency transportation surely has. Scorning the conventional row boat these Hughes Manufacturing Co. employees of Seward, Neb., took to their "Hyster" when the Big Blue River recently flooded the town. (Wide World Photo)



SUSQUEHANNA CROSSING—This 4,526-ft. structure will be built on the eastern extension of the Pennsylvania Turnpike.

Low bid is $4.7 million on Penn Turnpike bridge

Booth & Flynn of Pittsburgh recently have been announced unofficially as low bidder on construction of a 4,526-ft. bridge to carry the Pennsylvania Turnpike across the Susquehanna River. The firm submitted a combined bid for both substructure and superstructure totaling $4,777,500.

Second low bid was a combination of the bid of Booth & Flynn for the substructure and that of Bethlehem Steel Co. for the superstructure; these totalled $4,876,400.

This structure will carry four-lane traffic of the eastern extension of the Pennsylvania Turnpike. It will consist of 46 spans of deck girders and beams. The 45 land and river piers will set approximately 2½ ft. into solid rock. Decking of the two 26-ft. roadways will be of reinforced concrete.

T. J. Evans, chairman of the Pennsylvania Turnpike Commisison, estimates that construction work will require 480 days and will be completed about July 1, 1950.

Another announcement by the Pennsylvania Turnpike Commission states that of bids opened for construction of a 5-mile length of the eastern extension the low bidder is J. Robert Baisley, Inc., of Pottsville, Pa., with a $1,934,200 proposal. This contract calls for grading, drainage, structures and paving of turnpike in Middlesex and Silver Springs townships.

Low bid is $16.8 million on Chesapeake Bay bridge

Bidding on five separate contracts covering the superstructure of the Chesapeake Bay bridge, Bethlehem Steel Co., submitted a proposal totalling $16,854,000 last week.

Second low—and the only other bidder on all five sections—was American Bridge Co. of Pittsburgh with a $17,612,000 bid. Harris Structural Steel Co., of New York, bid $4,915,000 on two parts of the job.

Maryland's State Roads Commission has submitted the bids to J. E. Greiner, consulting engineer, for detailed study. Award of the contracts, which may be divided among the companies, is expected to be made soon.

Sections of the superstructure were divided for bidding, as follows:

Section 1—67 60-ft. beam spans, 21 100-ft. girder spans and seven 200-ft. girder spans for a total of 7,664 ft.

Section 2—Four 250-ft. deck truss simple spans and six 300-ft. deck truss simple spans for a total of 2,850 ft.

Section 3—12 deck truss cantilever spans for a total of 6,131-ft.

Section 4—Truss cantilever spans over the east shipping channel, 1,719 ft. long.

Section 5—Suspension spans over the main shipping channel for a total of 2,922 ft.

Towers 350 ft. high will support the main suspension span. Nearly 35,000 tons of structural and reinforcing steel will go into the bridge.

Contracts totalling $2,372,000 have already been let, including: Two contracts for supplying steel piling held by Carnegie Illinois Steel Co. and Bethlehem Steel Co.; test borings being made by Raymond Concrete Pile; test-pile driving by Tidewater Construction Corp. of Norfolk, Va.

Bids are due to be opened Mar. 22 on the remaining large contract—the substructure.

Phila. prestressed bridge finally awarded to Horst

Philadelphia's Walnut Street Bridge—first U. S. structure of its type—will be built by Henry W. Horst Co., general contractor (ENR Dec. 30, p. 16).

The long awaited contract was awarded last week on a $698,383 bid to the Philadelphia firm after much deliberation by the city solicitor's office. Low bid of $652,000, submitted by Corbetta Construction Co. of New York, accompanied an alternate design and was found unacceptable.

All other bids were based on the stipulated plans and specifications prepared by the Bureau of Engineering, Surveys and Zoning in cooperation with the Department of Public Works of the City of Philadelphia. Bids were opened Jan. 19.

◆

Highway officials hear $322 million Boston plan

Highways that are to be constructed in the $322 million master plan for Greater Boston should be under way by 1950, Harold J. Duffy, project engineer for the State Planning Board, told the recent session of the Association of Highway Officials of the North Atlantic States. The group conducted a three-day session at Hotel Statler in Boston.

Mr. Duffy stated that the eight radial highways to be built within the city will total 87 miles, will each carry up to 80,000 vehicles a day by 1970, and will take at least 10 years to complete.

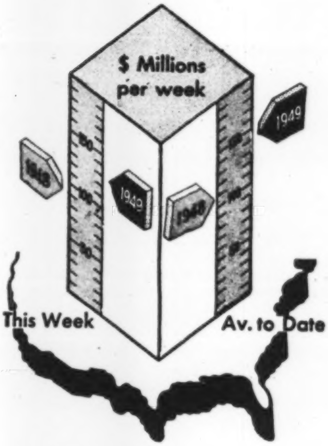
"Work is already proceeding on some of the essential projects of the plan," he said. "The Mystic River Bridge construction is under way. Work on the East Boston express highway has been started and construction plans for the second traffic tunnel under Boston Harbor are progressing."

He expressed the belief that the system should be financed by bonds rather than on pay-as-you-go basis, and said that provisions should be made for toll payments on at least some of the roads.

Among other speakers at the session were Thomas H. MacDonald, U. S. Commissioner of Public Roads, Wilfred Owen of the Brookings Institute, and Spencer Miller, Jr., State Highway Commissioner of New Jersey. These three outlined different phases of the transportation revolution which is severely overtaxing present highway systems.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost..	Mar.'49	474.80	228.24
Building Cost	Mar.'49	352.47	190.54
Volume	Feb.'49	255	112



Activity This Week

As reported to ENR

Amount of contracts let

(Millions of dollars, continental U. S. only)

	Week of Mar. 17 1949	Cumulative 1949 (11 wks.)	1948 (12 wks.)	% Chge
Federal	$29.4	$247.2	$284.8	−5
State & Mun.	38.0	514.7	416.3	+35
Total Public	$67.4	$761.9	$701.1	+19
Total Private	59.8	797.4	585.7	+49
U. S. Total..	**$127.2**	**$1,559.3**	**$1,286.8**	**+32**

Contracts by type of work

	This Week	Cumulative 1949 (11 wks.)	1948 (12 wks.)	% Chge
Waterworks.	$4.3	$28.3	$38.6	−20
Sewerage ..	3.8	40.8	36.3	+22
Bridges	4.1	76.8	52.1	+61
Highways ..	6.4	98.1	157.1	−32
Earthwork, Waterways.	18.3	104.1	139.7	−19
Buildings, Public	25.5	363.6	230.9	+72
Industrial .	2.1	209.0	148.2	+54
Commercial	11.3	519.8	381.3	+49
Unclassified .	11.4	118.8	102.6	+26

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (11 wks.)	1948 (12 wks.)	% Chge
NON-FEDERAL ..	$1018.7	$714.2	+56
Corporate Securities	495.7	386.9	+40
State and Municipal	523.0	327.3	+74
Total Capital	**$1018.7**	**$714.2**	**+56**

AGC hears explanation of percentage contract

A form of contract, called "The General Percentage Contract," was explained to the recent AGC convention by R. E. Dougherty, past-president of ASCE and retired vice-president of The New York Central Railroad. While the form is not new, it has not been used as widely as it might, especially in unsettled times (it was used successfully in the Toledo Lake Terminal).

This contract has basic cost and basic fee provisions under which an approximate estimate of quantities of work is given to the bidder, who submit unit prices or lump-sum figures for the various items. The total would be called the basic cost. The contractor would submit a fee figured as a percentage to be applied against the basic cost and called the basic fee.

In addition to these figures, a lump sum would be quoted for plant rental and for use of equipment.

Upon completion of the work the exact quantities are prepared with a new estimate, using the new quantities with the unit and lump sums mentioned in the original bid. This is called the revised basic cost, and the percentage fee on this new figure is called the revised basic fee. If actual cost is less than revised basic cost, the contractor, in addition to the revised basic fee gets 50 percent of the saving, not to exceed 50 percent of the revised basic fee. Should actual cost exceed revised basic cost, the contractor's fee is reduced from the revised basic fee by 50 percent of such excess, but by not more than 50 percent of the revised basic fee.

Air Force offers reserve commissions

United States Air Force Reserve commissions are now available to qualified engineers. Commissions in grades ranging from second lieutenant to colonel will be filled by applicants who can meet the requirements of age, education, experience and physical condition.

Those possessing degrees in architectural, structural, civil, mechanical, industrial or electrical engineering; city management or planning; or industrial management are eligible. A minimum of three years' experience is required.

Grades will be based on total number of years of qualifying experience with the following scale of minimum requirements: lieutenant, 3 years; captain, 7 years; major, 14 years; lieutenant colonel, 19 years; colonel, 25 years.

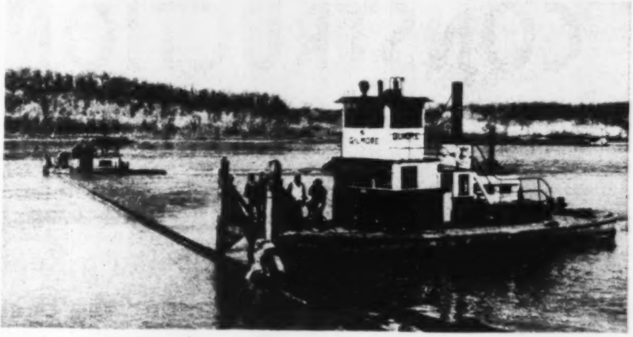
Full details as well as applications may be obtained by writing the Commanding General, Headquarters, First Air Force, Fort Slocum, N. Y.

◆

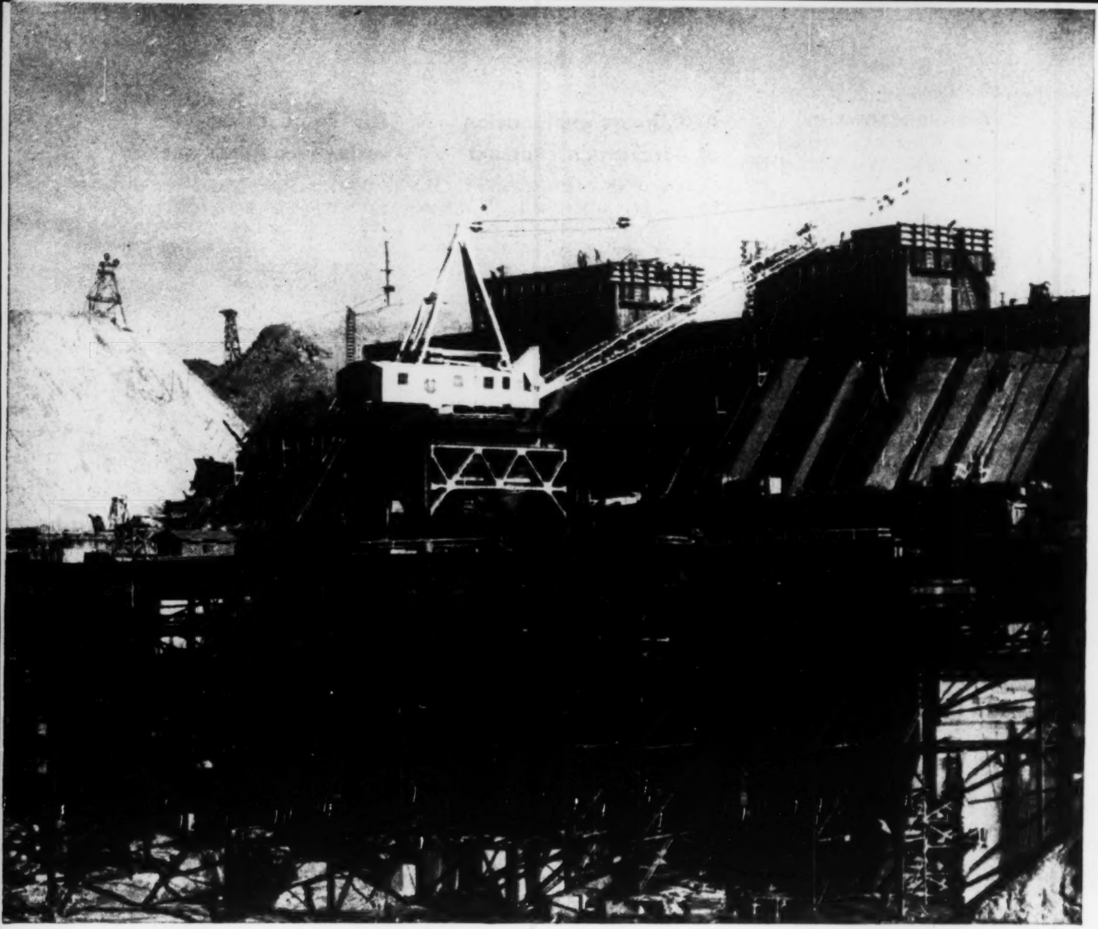
St. Croix River bridge low bidder announced

A bid of $804,305, submitted by the Industrial Contracting Co., Minneapolis, was recently accepted for the substructure of a new highway bridge at Hudson, Wis.

The $4,000,000 interstate bridge will replace a present toll crossing and is expected to be completed in 1950. Bids on the substructure were opened at the Wisconsin capitol by highway commissioners of both states.

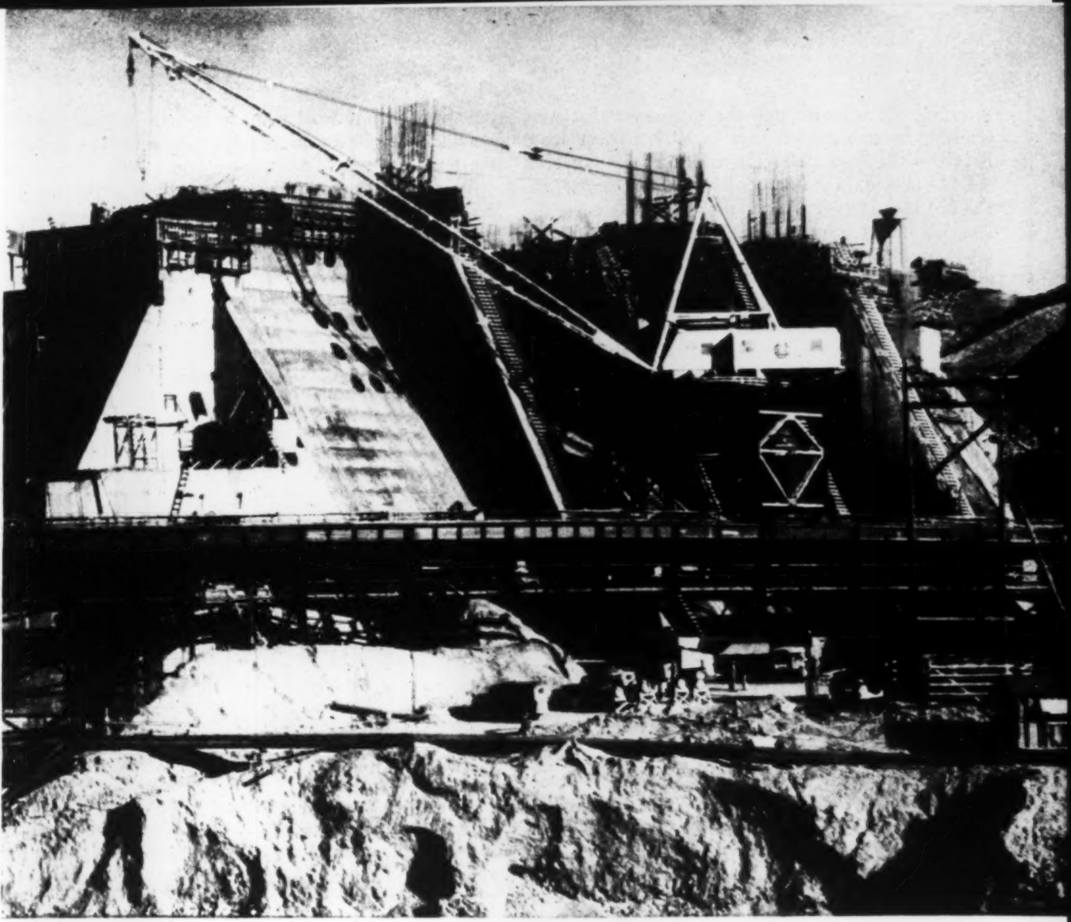


SWIFT WATERS FOIL PIPE LAYING—Tugboats and workers failed in this attempt to cross the Missouri River with welded steel, 22-in., crude oil pipeline. This is part of the $25,000,000 Oklahoma-Illinois project of the Shell Pipe Line Co. and Texas Pipe Line Co. Another attempt soon will be made to cross the 3,200-ft. wide stream. (Acme Photo)



CONSTRUCTION TODAY

A Survey and Forecast of Civil Engineering and Construction in 1948 and 1949, Being a Report on the Times We Live In and the Events That Shape Them.



DAVIS DAM represents engineered public works, a type of construction that expanded in 1948 and will continue to grow in 1949.

IN 1948 the construction industry regained its balance. The demand for its services continued to resemble a continuous series of five-alarm fires, but its various components had finally marshalled the means to fight them—not fully, yet to sufficient degree to keep from being pushed around. In 1949, therefore, the stage is set for the industry to recover its bearings, and then to concentrate its efforts more effectively than at any time since the war.

Materials production in 1948 increased until only spot shortages remained. Labor raised its productivity and stayed on the job. Equipment manufacture met demand in the majority of items. The cost rise ceased to accelerate, and engineers and contractors began to turn in estimates and bids that were close enough to suggest that they related to the same job. It was a year in which the insanity of a sellers' market began to be replaced by the less barbarous bargaining of a buyers' market.

In 1949 the strategy is to make good the gains of the last year; to stop cost rises, and roll them back if possible; to step up efficiency and, above all, to exercise the courage and ingenuity that has won so many construction battles in the past. Stabilization of costs and the opportunity for full focus of our previously-diverted mental faculties on the job itself will provide 1949 with two advantages that the other postwar years have lacked.

TOTAL CONSTRUCTION contracts in 1948 reached $17.4 billions of which engineering construction contracts reported by this journal accounted for $7.2 billions. Both figures are up 25 percent over 1947.

Total construction set an all-time record in dollars, and engineering construction was only 10 percent under its wartime peak. However, because the spending money used was inflated, the actual amount of physical construction still trailed the famous years of 1928 and 1929.

In terms of the prewar dollars of 1939, for example, 1948 construction volume was 18 percent less than in 1929. Reason: activities other than construction were diverting the materials and the manpower that were available to construction back in 1929. What could have been done in a physical sense had this not been so? The best measure of the industry's physical capacity was provided in 1942 when construction was made the king pin of the economy. Then ENR's physical volume index reached 480, 50 percent more than in 1929, and 90 percent above last year. In 1948, that would have been $33 billions worth of construction.

Somewhere between this artificial wartime figure and the $17.4 billions of contracts in 1948 is the capacity of the construction industry under today's economic conditions.

Our estimate for 1949 is $18 billions plus, a rise of 4 percent. For engineering construction alone, 1949 contracts should total about $7.9 billions, which is 10 percent more than last year. With housing past its peak, heavy engineering construction will be this year's leader. And there are plenty of projects to work on; ENR's measured backlog of proposed jobs totaled $43.2 billions at the beginning of the year, enough to support 6 years of heavy construction at the 1948 rate.

SIGNIFICANCE scarcely resides, however, in the size of the cash drawer. It is the disposition of the dollars that counts. The details of what was accomplished in 1948 are reserved for later pages in this issue. What is required here, by way of introduction, is characterization, the better to discuss trends that will determine or influence the shape of things to come in 1949 and later.

As in each year since the war, housing dominated the construction picture. Some 75,000 more units were started than in the previous year, putting the total, about 925,000, just behind the record year of 1925 to which 937,000 non-farm housing units are credited.

Sometime, the much prophesied million units a year will be built, but it won't be in 1949. The housing emergency is temporarily over. People have roofs over their heads. They are cooling off toward cracker-box shelter at luxury prices. Somewhere around 85 percent of the million a year goal is the prospect for 1949.

The second significant facet of 1948's construction picture was the growth in public works of the engineering construction type. If all types of construction are taken into account there was no change from the previous year—30 percent public and 70 percent private, reflecting the great contribution of private residential building. But in the $7.2 billions of engineering construction, public works represented 50.4 percent, a rise from 44 percent in 1947. This special emphasis on public works will remain as a characteristic of 1949, as both carry-over jobs and new pressures make themselves felt.

These pressures may be recognized in hospital and school programs, in sustained need for water supply and sewage treatment facilities, in the federal government's river basin development plans and in a growing realization that, despite what seem to be large expenditures for highways, we are badly neglecting what should be the top priority field for construction investment.

What happened to construction costs is the final determinant of 1948's significance. They rose over the previous year, but at a slower rate; whereas the rise was 12 percent in 1948, it had been 17 percent in 1947 and 18 percent in 1946. Of particular significance were growing signs of cost stabilization in the late months of 1948. One of these signs was a sharp break in lumber prices. Another was that prices of all other materials were stabilizing under the influence of high production and better supply. And still a third was the apparent elimination of cost-rise contingency items in contractors' bids. This contingency extra ranged anywhere from 10 to 25 percent. If contractors feel they can safely eliminate it, stabilization, even reduction in construction costs, is a certainty for 1949.

WHAT IS IN STORE for 1949 is further revealed by some of 1948's notable events. The Atomic Energy Commission began its billion-dollar capital expansion program. The Federal Power Commission authorized 3,300 miles of gas pipelines, and accumulated applications for 13,500 miles more. The Associated General Contractors and the American Federation of Labor set up machinery to settle jurisdictional strikes without work stoppages. The Missouri Basin Inter-Agency Committee spelled out the details of its six year $2.25-billion river current program while continuing to step up the tempo of its dam building jobs. These were developments of import for the future. And there were others.

Contracts were let for the $14 million dollar Delaware River Bridge at Wilmington. Work began on a 100-mile eastward extension of the Pennsylvania Turnpike. Bids were taken on an aluminum arch bridge and a prestressed-concrete girder bridge. The U. S. Public Health Service set up 14 river basin offices as a prelude to a huge program of stream pollution abatement. Both concrete and asphalt runways were built to take 300,000-lb. airplanes. Canal and dam contracts for the Columbia Basin power and irrigation project multiplied, and included some 1,350-sec.-ft., pumps, the largest ever. Prefabricated house companies got an allocation of 59,000 tons of steel. And the Building Officials Conference of America and the Pacific Coast Building Officials Conference agreed to work together, lending hope for building code advance.

These are some of the highlights that illuminated the 1948 picture. They are among the factors that make it possible to hazard the following guesses as to 1949 activity: public buildings up 30 percent; highways up 17 percent; irrigation and flood control up 15 percent; sewerage up 10 percent; bridges up 5 percent; waterworks up 4 percent; industrial buildings up 5 percent; pipelines, tunnels and other miscellaneous work up 10 percent; and commercial buildings and mass housing

EQUIPMENT MEN saw the return of a buyer's market in 1949. Even though heavy items like these weren't being made fast enough to satisfy the contractors, many lighter lines loosened up in 1948.

will exhibit no change in total volume. Materials, machines and men are the necessary ingredients of these gains. Are they available?

Materials Supply Improves

SHORTAGES OF BUILDING MATERIALS, which had hampered construction operations since the end of the war, were alleviated in 1948, as building materials production broke all records. Toward the close of the year, in fact, supply and demand were more nearly balanced than at any time since 1945, except for some local shortages. Expansion of production facilities for some products and operation of existing plants at higher rates resulted in the creation of inventories at distributors' levels for the first time since the war ended. Extended to more lines in 1949, this trend for supply to overtake demand will help eliminate one of the most burdensome and cost-increasing factors in current building construction.

The probabilities on materials supply line up about as follows: Steel will continue tight this year, but a favorable factor is that the waiting period for fabricated structural steel is steadily decreasing. It is highly probable also that cement will be available in sufficient amounts, production having reached an all-time high in October. Construction lumber, too, appears to be in ample supply. No surplus of millwork is reported, but the backlog of orders on hand has been steadily decreasing. With the improvement in nail production, local shortages will be less common and less severe than last year. Gypsum board and lath, roofing materials, building board, insulation, plumbing fixtures, brick and tile will probably be available as needed. Steel pipe and reinforcing bars, however, may remain difficult to obtain for some time, whereas the supply of cast iron pipe has shown improvement.

Easing of supply has not, in general, been accompanied by price declines. In fact, with the exception of lumber and paints, building material prices resumed their upward trend, despite price hesitancy accompanying the general break in the commodity markets in Feb., 1948. Lumber prices have been on the decline since last summer. Paints have been virtually unchanged in price for about a year. But the prices of other building materials reached all-time highs at the end of 1948 and, for some items, continued upward. Current levels, however, give all indication of being peaks. In 1949, many prices should decline, like lumber, or level off, like paint.

Pricing System Challenged

ONE OF THE SPECTACULAR EVENTS of 1948 occurred April 26 when the U. S. Supreme Court ruled against the basing-point delivered-price system used by the cement companies. The court said that the system resulted in price discrimination between purchasers, that it was maintained by concerted action and that it, therefore, restrained competition. The apparent result was to outlaw delivered prices in favor of mill prices, with the customer paying the freight previously absorbed to greater or less degree by the manufacturer. Later interpretations seem to say that delivered prices may be used in individual situations to meet competition, but that they may not be resorted to on a systematic zonal basis.

The net result is widespread confusion not only in the cement industry, but in all others using delivered-price systems, including steel. These two important construction industry suppliers are now selling f.o.b. mill. The consequences to contractors are many. They must become freight rate experts. In figuring bids for a job, they must take the chance that a competitor will be able to buy his materials cheaper. And they must run the further risk that the source of supply that they figured on may not be available when the time comes to ask for delivery, and that a more expensive source will have to be used.

How disadvantageous these consequences may prove to be will be clearer during 1949 as more experience with the new pricing system becomes available. In the meantime, in the industrial field, some companies are beginning to establish new plants closer to sources of material supply, as for example steel. In the cement field, the tendency would be for the reverse to happen—for cement companies to establish new plants nearer large consuming markets. So far this has not happened, nor is it likely to happen in 1949. There is still a chance that Congress eventually will do something to restore freedom in selling practices to American industry, with proper safeguards against and penalties for collusive price fixing. But the prospect for legislation during 1949 is not very good.

Equipment Buyer's Market Returns

IN ADDITION TO a better materials situation, the familiar post-war shortage of construction machinery all but disappeared by the end of 1948, as a result of two factors: Continued increases in output and sales, and shrinkage in demand.

During the year, shovels in the ¾-1½-yd. range, and all but the heaviest tractors and graders joined small shovels and other production equipment on the immediate-delivery list; and supply of the big machines now rapidly approaches the demand. Custom-made items like weigh-batchers and giant draglines still are tight.

Manufactured output increased 10 percent in dollar volume during 1948, while the price index increased 7 percent. More than the net volume increase remained on the domestic market, however, because the volume of exports decreased somewhat. Total sales, reflecting transactions in both new and used equipment, increased more spectacularly, from $800 million to $1 billion. Although the majority of sales were new, activity in used equipment (about 50 percent over 1947) obviously was most significant in the expanded turnover.

One of the more important signs of shrinking demand was tied in with the used-equipment upswing. Not only were contractors trading instead of buying outright, but they were demanding higher allowances more frequently than they had during the previous year. Credits on machines were less liberal and collections were slower. Other cautious moves included inventory reductions by distributors and increased numbers of requests for rental-purchase options by contractors.

Even with this easing in the construction equipment market, however, it is doubtful whether the over-all price index will go down much in 1949. Manufacturers' tendencies to reduce profits in order to meet competition will be counteracted by increased labor and steel costs. Equipment distributors and manufacturers alike expect some regional sales decreases (as much as 25 percent in one area). These decreases will be partly in response to a leveling-off in the construction curve, and partly in reaction to the 1946-48 wave of buying to replace worn and non-standard wartime machines.

It all adds up to a buyer's market in 1949. And, as if in well-timed anticipation of the day when the buyer again could pick and choose, the greatest display of construction equipment ever assembled took place in Chicago in July. There, at the Road Show, thousands of contractors, engineers and public officials from all over the United States and abroad set their sights and made their plans for an unparalleled machine age of construction.

Worker Productivity Improves

A MODERATE INCREASE in worker productivity in 1948 can be ascribed to disappearing shortages among the three construction elements—materials, machines and men—a growing will to work and increasing good judgment in management. With eight percent more workers, the construction industry did twelve percent more work.

Shortages of help in all but the trowel trades ceased to exist in most areas during the year. Average employment by contractors was 2,000,000, which was 140,000 more than the 1947 average. And, construction wage rates rose 10 percent. Such signs of healthy conditions —more men getting more pay for more production— were welcome.

On the other hand, apprenticeship, the normal and logical source of new skilled workers, failed to expand uniformly during the year, despite sincere efforts by contractors, public agencies and national unions. In fact, after jumping from 116,000 to 131,000 in the first four months, the total number of apprentices reported to the Bureau of Labor Statistics remained almost constant during the last eight months. Apprentice graduations amounted to 9,200. This year the number will rise to four or five times that figure as indentures end for most of the first full-year postwar group. Total employment, nevertheless, will not exceed that of 1948.

Applicability of Labor Laws

THE CURRENT YEAR also should see clarification of legal problems relating to labor that became urgent in 1948, principally whether or not federal labor laws applied to the construction industry.

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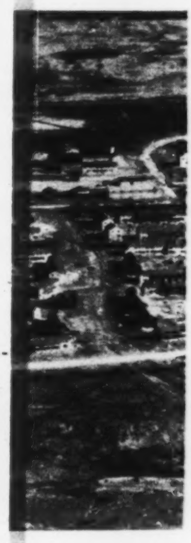
Second, the older wage-hour law, which for a decade had been almost innocent of construction implications, was found by the Supreme Court to contain provision for overtime-on-overtime wage payments—a joker that took the law out of the minimum-pay category and applied it to all wage rates. This threw the whole industry into confusion, for if it applied to construction, contractors would have to pay more for most work, and they would have to add costly accounting procedures; and unions would have to alter wage agreements fundamentally to maintain complex differentials among the trades.

The Taft-Hartley problem, though tested by a few cases, was left mostly unsolved. On the chance that the prohibition of jurisdictional strikes and secondary boycotts might apply to all construction, unions apparently tried to avoid those practices. Jurisdictional strikes were almost non-existent during the year, a situation that was welcome to both management and labor.

But the overtime-on-overtime problem appeared no nearer to solution in December than it had been in the middle of the year when it first came up. Employers and unions did make minor contract alterations—revision of the work week to make it start on Monday, for instance—to avoid some of the decision's effects, but



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Hence, if predictions are correct, although labor laws will embrace all construction, the 1948 confusion with those laws will disappear in 1949.

Innovations in Building

THROUGHOUT 1948, newspapers and popular journals showered scathing criticism on the building industry, blaming high costs (particularly for housing) on obsolete construction methods and archaic building codes. In turn, the Construction Industry Information Committee unleashed a flood of news releases that pointed with pride to the industry's achievements, and many communities, re-examining their regulations, looked around for a model performance-standards code

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Equipment Buyer's

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Applicability of Labor Laws

THE CURRENT YEAR also should see clarification of legal problems relating to labor that became urgent in 1948, principally whether or not federal labor laws applied to the construction industry.

HOUSING OF ALL TYPES continued to be the most significant factor in the construction picture, but the big post-war push was over. This is Park Forest, Ill., where 3,010 units were under way during the year.

First, the new Taft-Hartley law had leveled its guns at the unions' pet trouble-makers, the jurisdictional strike and the secondary boycott. If construction was in the stream of interstate commerce, and therefore subject to the Taft-Hartley law, constructors could obtain injunctions against these trouble-makers, and thereby avoid slow-downs and stoppages that previously were beyond the constructors' control.

Second, the older wage-hour law, which for a decade had been almost innocent of construction implications, was found by the Supreme Court to contain provision for overtime-on-overtime wage payments—a joker that took the law out of the minimum-pay category and applied it to all wage rates. This threw the whole industry into confusion, for if it applied to construction, contractors would have to pay more for most work, and they would have to add costly accounting procedures; and unions would have to alter wage agreements fundamentally to maintain complex differentials among the trades.

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But the overtime-on-overtime problem appeared no nearer to solution in December than it had been in the middle of the year when it first came up. Employers and unions did make minor contract alterations—revision of the work week to make it start on Monday, for instance—to avoid some of the decision's effects, but the best attack seemed to be: (1) to obtain NLRB determinations as to whether and how the law applied to specific jobs; and (2) to urge corrective legislation by the 81st Congress.

NLRB job determinations established a confusion rather than a pattern of applicability and non-applicability, so the second attack became the one most likely to succeed.

Now, as the 81st Congress sits it appears that both basic laws will extend to virtually all construction, by making those laws apply to activities "affecting commerce." The extension will be effective because the historic growth of the commerce power has made that instrument•will-nigh limitless in potential. The power to nip jurisdictional strikes and secondary boycotts will continue despite deletion of the word "injunction" (hated by Labor) from the Taft-Hartley law's successor. And construction will be exempted specifically from the overtime-on-overtime decision's effect.

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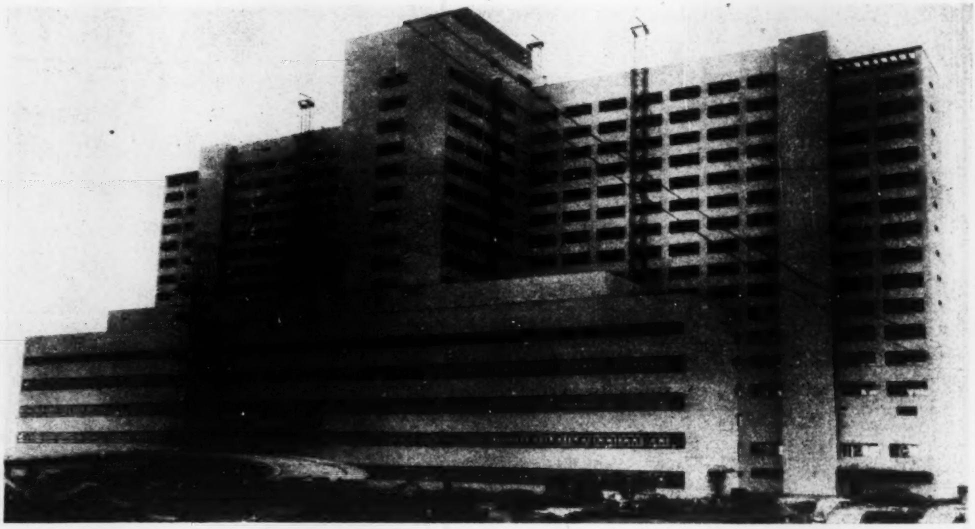


VETERANS HOSPITAL, at Fort Hamilton in Brooklyn, is one of several such facilities built by the government. Twenty hospitals costing $145 million, in the VA $1.1 billion program, were put under contract last year.

that could be used as a basis for useful revisions.

Meanwhile, high construction costs kept designers and builders on their toes. The situation was favorable for the introduction of new materials and methods.

Here are some of the more significant construction techniques that came to the fore in 1948: Placing of concrete by cranes on the ground directly into floor-slab forms in buildings up to 14 stories high; mechanization of roofing operations, such as the pumping of tar or pitch to the roof, and the laying of felts by machine; and prestressing of a warehouse concrete floor.

Perhaps the greatest ingenuity was shown in wall construction. Here, with the continuation of the trend toward prefabrication, sandwich walls made of various materials were introduced; even when they were more expensive than conventional materials, there was economy in their use due to savings in construction time and labor. Also, these walls are thinner than conventional walls and generally require less maintenance. They consist mostly of exterior facings of aluminum, stainless steel, asbestos-cement or dense concrete, and back-ups of carbon steel, asbestos-cement or concrete, with a core of rigid or fiber insulation.

With respect to conventional wall materials, there has been a trend toward greater use of vacuum processing and lifting, and of tilt-up construction. In either case, walls are cast horizontally and then raised into position when hardened.

Several innovations in structural framing aimed at cutting costs are also significant. For example, in 1948 standardized welded connections for steel beams were introduced. A new type—"umbrella"—roof truss was tried for a New Orleans factory and found economical. And a four-story building was erected with a frame of precast concrete at a cost competitive with fireproofed structural steel.

The growing use of lightweight aggregates in concrete and plaster is having a marked effect on the weight of buildings. On the 30-story John Hancock office building in Boston, for example, the weight of steel alone was reduced 2,000 tons by substituting vermiculite for sand and using steel floor decking. The total dead weight of the 12-story Equitable Building in Portland was cut 1,200 tons with perlite in the plaster while on the 9-story Prudential Building in Los Angeles this weight reduction was 15,000 tons with vermiculite in the plaster and pumice in the concrete.

An innovation in the fire protection of open stair wells was introduced in the unique Terrace Plaza Hotel building in Cincinnati. In the 7-story department store base under the hotel, the escalators are protected by air-exhaust and sprinkler systems. The air-exhaust will halt the updraft of fumes, and the sprinklers will eliminate convection currents by spraying water to cool the heated air. No inclosures are needed.

Housing Up, Prefabs Disappointing

PREFABRICATION, which many had looked to as the solution to the housing shortage, turned in a disappointing performance again. Only about 40,000 units—less than one in twenty houses erected in 1948—came from the plants of recognized manufacturers. There is, however, one bright spot in the picture—the start of production on the Lustron Corp. house, a two bedroom unit with a light-gage steel frame and porcelain enameled steel walls and roof. The plant at Columbus, Ohio,

ATOMIC CONSTRUCTION had its busiest year since the secret boom of World War II. At Brookhaven Laboratory, on Long Island, the Atomic Energy Commission is building this nuclear reactor complex. The 320-ft. stack is part of the air cooling system

has a capacity for mass-fabricating 45,000 of these dwellings a year.

While prefabrication was slow in getting moving, conventional house construction came near beating previous records. About 925,000 starts on new permanent dwellings were recorded in 1948. Of these, 910,000 were privately financed, as compared to the all-time high of 937,000 in 1925 and the 850,000 in 1947.

Houses in 1948 cost about 15 percent more than during the previous year, the total value exceeding that of 1947 by $1.7 billion. All told, $7 billion was spent for private residential construction in 1948.

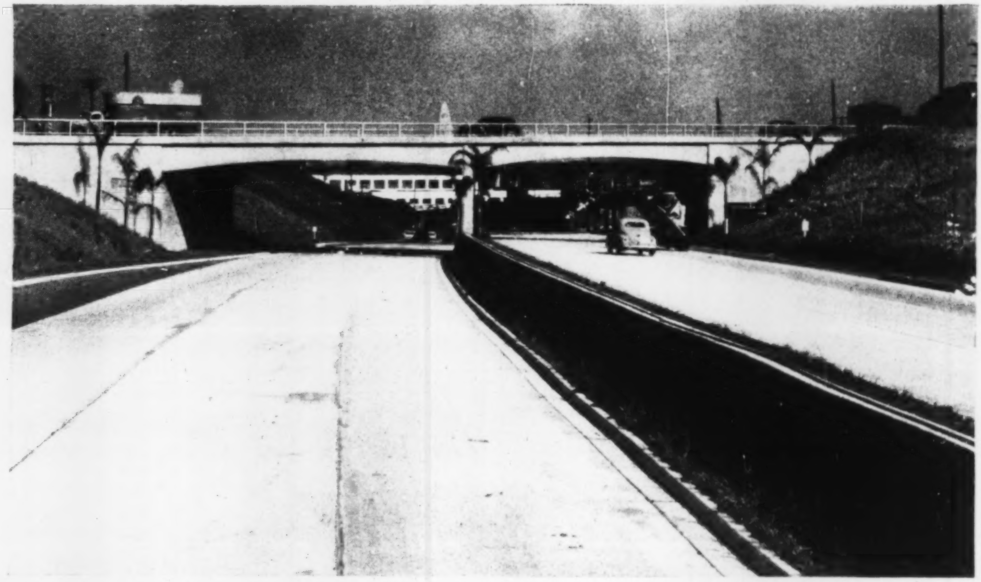
Toward the end of 1948, home buyers became more selective—apparently an indication that the edge had been taken off the housing shortage. Some price declines were noticeable. The National Association of Home Builders encouraged its members to build "economy" houses to tap the low-price market. Thus, the outlook for 1949 residential volume is that it will be smaller than in 1948—probably by about 5 percent.

Housing Laws to Ease Credit

THE 80TH CONGRESS, anxious to keep private residential construction going full blast, was cautious in its attitude toward housing legislation. Afraid of inflation, the Congress nevertheless saw a need for counteracting the tightening of credit in the mortgage market but turned thumbs-down on the omnibus Taft-Ellender-Wagner Bill, which was intended to encourage construction of 15,000,000 dwelling units in 10 years. Rent control was continued to March 31, 1949, with increases up to 15 percent permitted on voluntary agreement by tenants. To facilitate the financing of homes, particularly for ex-servicemen, approval was given a bill authorizing the Federal National Mortgage Association —a subsidiary of the Reconstruction Finance Corp.—to buy up $840,000,000 worth of mortgages insured by the Federal Housing Administration and by GI loans. And an act was passed to revive rental-housing mortgage insurance under Title VI of the National Housing Act. This bill furnished mortgage-insurance assistance to on-site fabrication and to manufacturers and dealers in prefabricated housing. It also established a division within the Housing and Home Finance Agency to promote standardization of building codes and the development of standardized dimensions and methods for assembly of building materials and equipment.

Assisted by this legislation, the FHA in 1948 insured mortgages covering 400,510 units, the largest volume of any year in FHA history—twice as large as the volume in 1942, the previous high. Over 70 percent of the units were in new housing. By the end of the year, total insurance written by the FHA since the beginning of its operations in 1934 amounted to $14.5 billion. About half of this is still in force.

The election of a Democratic president and Congress last November points to probable passage of the public-housing and slum-clearance portions of the T-E-W



FREEWAYS, EXPRESSWAYS, PARKWAYS—limited access roads by several names, popped up in new places and spread in old, in response to pressures of increasing traffic congestion. Southern California's Santa Ana Freeway is one of them.

Bill, continuation of rent control, liberalization of RFC's secondary market for mortgages, and extension of FHA's rental housing program. There is a chance that government's support of home building may be switched mainly to rental housing. There is also a possibility that further encouragement will be given to housing research.

Toward Better Housing

IN THE MEANTIME, private industry has acted to stimulate research. Last month, the National Academy of Sciences and its operating agency—the National Research Council—organized a Building Research Advisory Board to do for building construction what the Highway Research Board has been doing for roads for the past 30 years.

This new board's initial program is set up on a 5-year basis, but the work is expected to be extended beyond that limit and to become a permanent function of the National Research Council. Funds to finance its activities are being raised by the Research Activities Committee of the Construction Industry Advisory Council, created under the aegis of the U. S. Chamber of Commerce.

Without the aid promised in the T-E-W bill, housing research in 1948 nevertheless was far from inactive. At the University of Illinois, for example, the Small Homes Council, carrying out time studies on the industry-engineered house, found money savings in preassembly of the parts and in the use of a roof truss instead of conventional beams. The Housing and Home Finance Agency investigated and reported on various technical problems, such as prevention of condensation in attics and economy of basements. At Massachusetts Institute of Technology, a house was built to investigate the feasibility of solar heating. National Bureau of Standards engineers developed a structural design procedure for small houses and published performance standards for incorporation in building codes. But probably the greatest amount of research went into the basic building code of the Building Officials Conference of America, which is being proposed as a national model. This document is expected to be available by mid-1949.

The need for a model code was demonstrated by an NBS survey. It showed that nearly half of all U. S. cities are either without a building code or are operating under regulations ranging from 20 to 44 years in age.

Some large cities are modernizing their codes, but the smaller communities apparently cannot afford the cost and undoubtedly would benefit from model regulations. Many are eagerly awaiting the BOCA code, which is claimed to be a performance-standards type. Actually, however, the building officials have been unable to prepare a purely functional code, because insufficient data are available. They are also fearful that a code of this type might be unenforceable. It is quite possible that if this fact were more widely known, more communities would cease waiting for a perfect code and modernize their regulations immediately by adopting one of the better codes now available, such as the

Uniform Code of the Pacific Coast Building Officials Conference, a new edition of which will be available this year.

School Construction Backlog Huge

ASSOCIATED WITH the housing shortage has been a school shortage, which still is critical. It arose as a result of a long period of underbuilding, a rapid increase in enrollments, migration of population during and after the war and the need for organizational changes to attain larger and more efficient administrative units and expanded curriculum—objectives difficult to achieve in outmoded structures. At the college level, facilities of many institutions have been overwhelmed by students enrolled under the GI Bill of Rights, but inadequacy is also apparent in grade and intermediate schools, and will become more so when the large crop of babies attains school age.

Expansion of educational building started almost with the end of hostilities and continued right on through 1948. From Jan., 1946, through Sept., 1948, contracts were awarded for about 7,200 educational projects. Some of this construction was temporary to accommodate student veterans, but most was in permanent new buildings, additions and major renovations. The value of public school construction put in place in 1948 alone is estimated at $550,000,000.

Nevertheless, an $11 billion investment in new school plant and equipment is required to overcome the critical shortage of educational facilities, according to the Office of Education of the Federal Security Agency. Many communities have approved bond issues to finance construction programs, but high costs are proving a major deterrent.

Hospital Construction Spurts

A SEVERE SHORTAGE still exists also in hospital facilities. The state plans for hospital construction submitted under the Federal Hospital Survey and Construction Act show that the U. S. and territories (exclusive of Nevada, which has not yet submitted a plan) have a total of 1,024,840 beds. Of these 145,313 are considered unacceptable because of obsolescence, unsuitable design, fire hazard or other failure to meet the standards set up by the agencies administering the program. The states estimate that 897,146 more beds are required.

To diminish this need, Congress approved early last year an appropriation bill for fiscal 1949, providing $60,000,000 in cash and $75,000,000 in contract authority for the hospital program of the U. S. Public Health Service under the Hospital Survey and Construction Act. By Dec. 31, a total of 643 initial project applications had been approved by the surgeon-general. The estimated total cost of projects, which will provide 31,633 beds, amounted to $366,000,000 of which the federal share was $107,000,000.

Meanwhile, the Veterans Administration $1.1 billion hospital program slipped into high gear. Twenty construction contracts were awarded last year to provide 6,925 beds in new buildings at a cost of $145,000,000, and four contracts were placed for 1,090 beds in additions costing $19,400,000. Early this year, following a restudy of 64 individual projects not yet under contract, President Truman ordered a reduction of 16,000 beds chiefly because of inability of the VA to staff even its present hospitals. The VA cancelled 24 hospitals and reduced the size of 14 others.

Atomic Plant Construction

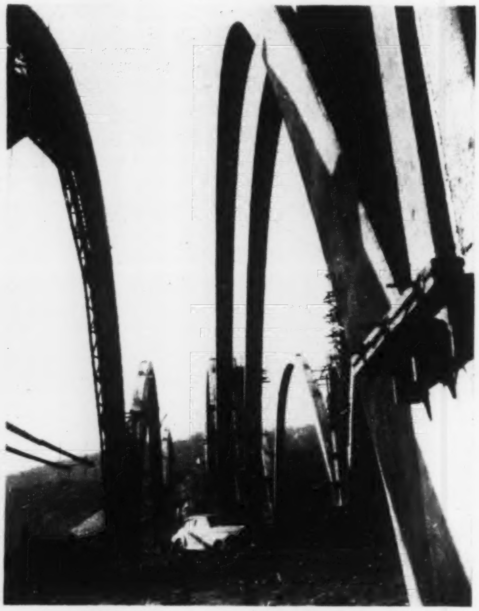
CONSTRUCTION activity far beyond general appreciation took place in the field of atomic energy development in 1948 and is still continuing. Not since the great installations at Oak Ridge, Tenn., Los Alamos, New Mexico and Hanford, Wash. were rushed to completion in complete secrecy during the war years has construction of atomic facilities played such a prominent role. Much of the secrecy still persists, but the Atomic Energy Commission has stated without qualification that it is carrying on the "greatest single construction program in American peacetime history."

Scheduled to cost $700 million dollars, it centers at Hanford, where 15,000 construction workers constitute the labor force, but involves new construction or major alteration at 20 other sites throughout the country. Purpose is to replace temporary war-built facilities, both factories and housing, with more permanent construction, and to enlarge research activities along lines of peaceful applications of atomic energy. Despite this significant nod toward medicine, biology and power production, however, AEC effort is still predominately military. Bigger, better and cheaper bombs remain the objective.

In addition to housing, schools, hospitals, roads and streets at the three permanent communities, new plants and nuclear reactors were built at Hanford as well as warehouses, shops, railroads, bridges and storage facilities for radioactive wastes. Three new laboratories were begun—Argonne near Chicago, Brookhaven on Long Island and Oak Ridge—as well as research centers at Berkeley, Calif., Schenectady, N. Y. and Ames, Iowa. In 1949, this high tempo of construction activity will continue unchecked, and, it may be hoped, under a somewhat more liberal policy of publicity. A program of such magnitude must necessarily involve new methods of design and construction that the whole industry should know about.

Road Work at Record Level

HIGHWAY CONSTRUCTION broke all records for dollar volume of new work done in 1948, but it fell far short of what should have been done. Due to the lowered purchasing power of the dollar, the actual physical accomplishment was only about the average of the prewar years, and no gain was made on the accumulated deficit of the war years. As motor vehicle



MORE LARGE BRIDGES were placed under contract in 1948 than in 1947. This is Pittsburgh's Commercial Avenue Bridge, which will carry the Penn-Lincoln Parkway across Nine-Mile Run.

registrations have risen from 34,472,000 in 1941 to an estimated 40,700,000 in 1948 it is obvious that just meeting the normal depreciation would require an annual mileage of new or reconstructed pavements considerably higher than in prewar years.

Highway work programmed for this year by the state highway departments, according to a survey just made by this journal, will be slightly less than in 1948. That is not encouraging, yet the picture may not be quite as dark as it appears. In the first place, the state highway departments are realistic program makers. Most of them are short of personnel to do the engineering work that must be done to convert preliminary plans into contract specifications and to supervise construction. They have to work against that physical limitation. Then too, the 1949 plans were made in full knowledge of the fact that some critical materials might not be any more plentiful than in the year just past. And at the time they were made, the slight decline in construction costs that now is evident was not apparent.

If there is an improvement in the supply of engineers, if materials are in easier supply and contractors looking for work, the latter part of the year may see a definite upswing in highway contracts.

Looking ahead, there are clouds on the legislative horizon. Both in Congress and the state legislatures there is evidence of growing pressure for more money for farm-service roads; and from the cities is coming a growing demand for more money for badly-needed arterial routes into and through congested areas. Because of the preponderance of rural votes in state legislatures, there is grave danger that the movement to increase the percentage of the total road money that goes to rural roads will succeed just at a time when the shift should be the other way for at least a decade.

Better Built Highways

VIEWED INDIVIDUALLY, the technical improvements in highway design and construction during 1948 do not appear impressive. But, collectively, they add up to a substantial total that will have both an immediate and far reaching effect on roadbuilding. To mention only a few: Thickened edge pavements were abandoned to a large degree, in favor of a uniform thickness of concrete slab. Granular material is used more extensively beneath concrete pavements to reduce frost action and to furnish better sub-drainage. A continuing trend is that of substituting contraction joints for expansion joints in concrete pavement. And ice control by internal heating is getting considerable attention—one notable example being the 500-ft. test section of highway just outside of Ferndale, Mich. where both asphalt and concrete pavements are being kept free of snow and ice, using electric current as the heat source.

Many states concentrated last year on developing flexible pavements using local aggregates, to reduce construction costs. In this connection, equipment manufacturers have developed considerable labor-saving equipment to reduce the amount of high-priced, hand labor on construction. A notable example is a front-end loader, used both on construction and in highway maintenance.

Air-entrained concrete was used more extensively last year as better means were developed for measuring and controlling the amount of entrained air, and as research disclosed more of the structural qualities of the concrete. Better methods of moisture control and soil compaction were developed, resulting in a more stable roadbed with less danger of pavement pumping. Sand-drains, installed to accelerate subgrade consolidation, proved their worth in several instances, and should enjoy more widespread use in the future.

Bridge Building Forged Ahead

BRIDGE CONSTRUCTION forged ahead during 1948 to establish a total of just under $300 million of contracts—representing a 50 percent increase over the 1947 total. This accelerated bridge building program got off to an even better start this year, when $29,700,000 worth of contracts were awarded during January.

In contrast to the previous year, when most of the bridge activity was concentrated in small structures, 1948 saw substantially greater emphasis placed on large bridges. Notable in this category are the $37,000,000 Chesapeake Bay bridge just above Annapolis; the $40,000,000 Delaware River bridge near Wilmington; the $27,000,000 Mystic River toll bridge near Boston, Mass.; and the $14,000,000 Tacoma Narrows bridge in Washington. The awarding of contracts for these, and other large bridges, indicates increased availability of construction materials and easier credits for financing the work.

Three bridges—two started last year and the other to be built this year—are of special significance to bridge engineers since all represent relatively new concepts of bridge design in the United States. One is the three-span (74-160-74 ft.) prestressed concrete deck-girder bridge to be built in Fairmount Park, Philadelphia. The second is the all-welded five-span (78-100-120-100-78 ft.) continuous steel deck-girder bridge now under construction at Iowa City, Iowa. More welding is being used on bridges, both in the field and in the shop, but fully-welded bridges are the exception. The last of these three new bridges is a 100-ft. plate-girder railroad span of aluminum alloy completed at Massena, N. Y. Its construction is the more significant because of parallel developments in aluminum bridges in other countries: England completed a 121-ft. span double-leaf bascule at Sunderland, and Canada awarded a contract for a 290-ft. arch at Arvida.

Noteworthy in the extreme is the renewed interest in large suspension bridges, none of which has been built since the Tacoma Narrows collapse in 1940. Aerodynamic instability, the cause of this shocking failure, has been countered in the design of the new Tacoma Narrows structure by venting the roadway, by increasing the width-length ratio and by increasing the depth of the stiffening members, which are changed from girders to trusses. These or other special details will be included in the other suspension spans that appeared on the horizon in 1948: the 2,150 ft. Delaware River span at Wilmington, for which foundations are underway; the 1,700 ft. Hudson River span at Kingston for which preliminary plans were completed; the Brooklyn Bridge, plans for whose reconstruction were authorized; and the new San Francisco Bay crossing, studies for which indicate that it will duplicate the existing bridge which contains two 2,310-ft. suspension spans.

Among the smaller bridges that established new precedents during the past year was a concrete structure in Niles Canyon, Calif. consisting of single columns carrying a concrete box girder from which the roadway was cantilevered at either side. Also at Lumberville, N. J. a multiple span suspension footbridge was built utilizing a rope-cable stiffening system. The 240 ft. lift span of the Terminal Island bridge at San Diego is also worthy of mention as setting a new record for height of lift—from 50 ft. underclearance when down, to 175 ft. when raised.

Throughout the bridge field the battle to cut costs by simplifying designs and construction requirements continues, while the use of substitute materials is gradually being discontinued. Noticeable during the latter part of 1948 was a trend back to designing for economy instead of for availability of materials. The high cost of carpentry has had a marked effect on bridge design. The concrete girder bridge, with its large amount of formwork, has just about priced itself out of the market for short spans. For the same reason, more gravity-type abutments and retaining walls are being used instead of cantilevered structures. Large bridge projects continue to be separated into more than one contract, chiefly to speed the work since construction can be started before plans for the entire project have been completed. In contrast, lower bids often can be secured by combining several small bridges into a single contract.

AIRPORT CONSTRUCTION lagged in general, although congestion at some centers urged more work. At Idlewild airport the Port of New York Authority rushed multiple Quonset huts to completion and opened the giant field to overseas operations.

Airport Building Lags

LIKE ROADBUILDING, airport construction is not making the strides that were anticipated for it immediately following the war. At that time Congress authorized $520,000,000 in federal aid to foster the building of more and better airfields to accommodate a rapidly expanding air-transport industry. Part of that expansion has occurred, but cities and towns have been slow in taking up the federal money.

This reticence was due in part to delays in getting the airport construction program organized and in setting up the standards. But much of it appears to result from more fundamental obstacles. Local sponsors of better airports have had difficulty in getting city administrative bodies or the voters to put up funds to match the proffered federal aid; and air-transport companies have shown considerable reluctance toward agreeing to pay the higher rentals that are necessary to carry the greater investment in better fields. For example, at San Francisco, voters, last fall, failed to approve a bond issue for new runways and an administration building, and at New York the major airlines are in controversy with the Port Authority over the rentals asked for use of the new facilities at Idlewild airport.

In government circles, however, there is considerable optimism over the future outlook. A "National Airport Plan" has been prepared, as called for in the Federal Airport Act of 1946, which covers needed improvements at 4,431 airports. Its total cost would be $985,800,000, of which $441,600,000 would be federal aid. At the end of last year the Civil Aeronautics Administration had entered into contracts for $61,300,000 in federal aid at 528 locations. Jobs at 175 locations had been completed, involving $8,700,000 in federal aid. When work that had been definitely programmed at the end of 1948 is included, the federal aid involved is raised to $106,600,000, bringing the total cost of proposed work under the act to something over $200,000,000.

Railroad Construction Increases

CONSTRUCTION of new railroad facilities reached the highest dollar volume since 1930, according to RAILWAY AGE. The total of improvement projects costing more than $100,000 completed or under way at the end of 1948 rose to $365,000,000, exclusive of highway-railway grade separation work, which is estimated at about $100,000,000. Yard and terminal construction topped the list of new work, signal work was in second place and line revisions followed, there being 54 of these exceeding $100,000 in cost. Bridge work gained in 1948 due to greater ease in getting steel, the total work amounting to $29,000,000. A considerable part of the new construction was an outcome of the large purchases of diesel power made by the railroads in recent years, new or reconstructed engine terminals being required and sidings having to be extended to accommodate longer trains.

Federal Pollution Control

A NEW ERA in stream pollution abatement began on June 30, 1948. On that day, when Public Law 845 of the 80th Congress was signed by President Truman, federal control of water pollution became a reality. This is the culmination of an issue that has been bitterly debated for more than half a century, during which states' rights proponents resisted what they termed an invasion of their policepowers in protecting the health and welfare of the people.

The new law, entitled, "An act to Provide for Water Pollution Control Activities in the Public Health Service of the Federal Security Agency and in the Federal Works Agency, and for Other Purposes", is not intended to by-pass states rights. It recognizes the primary responsibilities of the states in controlling water pollution, and enforcement measures are limited to court action on suits initiated by or with the consent of the states.

Enforcement is only one aspect of the new law. Its broad objective is to encourage the states to take more aggressive action in curbing the discharge of untreated municipal and industrial wastes. To this end, technical and financial assistance is authorized. The latter, for which some appropriations may be expected this year, includes: (1) one million dollars per year for five years to the states for research on industrial waste treatment methods; (2) another million yearly for five years to aid in the financing of surveys and plans for remedial works; and (3) a total not to exceed $22,500,000 yearly for five years for loans to public bodies engaged in the construction of treatment works for sewage and industrial wastes.

To make ready for the time when money becomes available and to provide technical aid, the U. S. Public Health Service has already set up fourteen "river basin" offices throughout the United States. These are being administered from a newly established Water Pollution Control Division in Washington.

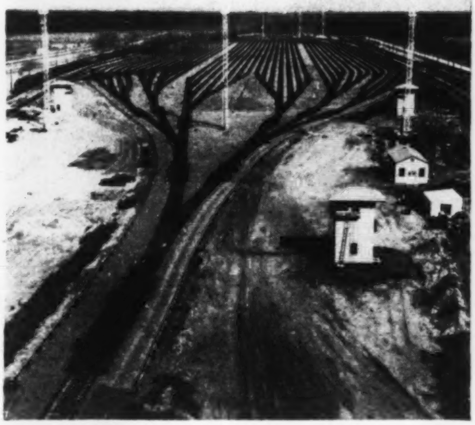
Interstate Pollution Abatement

STRONG EVIDENCE that the states have no intention of abdicating any responsibilities for stream pollution abatement now that a federal law is in existence comes from the growth and activity of interstate groups organized for this purpose.

Newest and biggest of these is the Ohio River Valley Water Sanitation Commission, which was formally organized on June 30 after long years of negotiation among the eight states in the basin. Operating in an area of some 200,000 sq. mi., the commission is tackling the problem of coordinating pollution abatement in the most heavily populated and industrialized section of the country.

In New England, too, an interstate agency has begun operations to handle pollution abatement on a regional basis. A New England interstate water pollution control compact was organized in 1947, and during the past year member states have been surveying the situation and gathering data for the development of an integrated program of attack.

One of the most active agencies is the Interstate Commission on the Potomac River Basin, comprising representatives from Maryland, West Virginia, Virginia, the District of Columbia and Pennsylvania. The work of this group has been distinguished, among other things, by the promotion of industrial waste abatement measures. Other agencies that are stimulating action



RAILROAD YARDS were expanded. This is the new Union Pacific 40-track classification yard at North Platte, Neb.

SEWAGE TREATMENT. Eighteen of these 110-ft. dia. digesters were built at Los Angeles' 245-mgd. Hyperion plant.

on a local level include the Interstate Sanitation Commission operating in the New York tidal area, and the Interstate Commission on the Delaware River Basin.

Record Year for Sewage Disposal

EMPHASIS placed on stream-pollution abatement finds its reflection in the amount of money being spent for sewage disposal facilities. The past year, with an all-time record expenditure of $226 million, showed a 29 percent gain over the previous year in dollar volume. Our prediction is that next year will show a further rise of about 10 percent.

Gaining in favor as the most desirable means for financing sewage-treatments works is the so-called sewer-rental or service-charge system. In this connection, the International City Managers' Assn. found that the number of cities (over 5,000 pop.) that levy charges of this kind had increased from 233 to 432 in the course of one year. Big cities like Cleveland, Detroit, Philadelphia and Buffalo average a return of more than $2 million yearly. There is still great variation in rates, and much confusion concerning the manner in which charges should be levied. All of this is now under study by a joint committee of engineers, lawyers and public works officials, a report from whom will prove to be a big boon to municipal authorities.

Sewage Treatment Trends

DRAMATIZATION of the need for increasing worldwide food production—through recent popular books and the publicity attendant on international discussions relating to population growth—has focused attention on conservation of soil fertility. This in turn has stimulated thinking on wider use of sewage sludge for fertilizer. Quite aside from its value as a humus component in soil, it has long been accepted that sewage sludge contains growth-promoting substances and values far beyond those that might be disclosed by simple chemical analysis. Research work at The Johns Hopkins University is now being directed toward discovering the type and quantity of these trace minerals in sludge and what their relation bears to nutrition.

None of this can be considered as simply academic by cities that are operating or planning sewage-treatment works. It may prove to be sound economics to provide facilities for fertilizer production from sludge. This is revealed most recently in an engineering study of the Houston, Tex. situation (ENR April 15, 1948, vol. p. 559), where an analysis of eleven different methods for disposal indicated that fertilizer production would provide an annual revenue of $268,000. Milwaukee and Chicago as well as some smaller cities, have long been engaged in the business of selling sludge for fertilizer.

Rich in promise among possible new treatment methods are the laboratory results achieved at Harvard University using pure oxygen in lieu of air for aeration. Termed "bio-precipitation," the process is biological in its action. The research indicates that when oxygen is employed for aeration, the size of plant required would only be one-quarter that of a conventional installation for treatment.

Not only by research but by group study are the resources of the sanitary engineering profession being made more useful. This is particularly true of the "Committee on Sanitary Engineering and Environment," that operates under the auspices of the National Research Council.

The committee was activated early in the war to render advice and assistance to the armed forces, and since much of its activity has been related to national defense, it has not given or sought publicity. But its deliberations have had a profound effect on many aspects of sanitary engineering, bearing as they do the stamp of authority from leaders in the profession who comprise the committee. Technical practice related to water chlorination, cross-connection control, disposal of radioactive wastes and procedures for sanitation and housing in Arctic areas are among the matters under the committee's purview.

Radioactive Wastes

AFTER A LONG PERIOD of hush-hush and uncertainty, the Atomic Energy Commission publicly admitted the possibility of environmental health hazards from nuclear fission operations, and has given recognition to the desirability of having sanitary engineers participate in the development of safeguards. In large measure these safeguards relate to means for the disposal of radioactive wastes that might otherwise find their way to the atmosphere, to the soil and to surface waterways.

In contrast to the attitude that prevailed a year ago, spokesmen for the AEC have done much to encourage participation of the sanitary-engineering profession in this new field of industrial waste disposal. Programs of training in nuclear physics have been initiated by the AEC, and research projects are being expedited. However, there has been some reluctance on the part of universities to undertake such research because of the special precautions that are required.

Meantime, the AEC has augmented its staff of sanitary-engineer experts, so that all in all the fission waste problem is being attacked with vigor and foresight.

Malaria Engineering

PUBLIC HEALTH is also being given a lift in the field of malaria control where the application of engineering methods and machines has reached a new high on the island of Sardinia where the Rockefeller Foundation is seeking to determine the possibilities of complete eradication of anophelines. Using DDT as the exterminating agent, and with the aid of planes, flame throwers, fog applicators and other mechanized equipment, an all-out eradication program was started in October, 1947. So successful have been the results that the campaign is being extended to general mosquito elimination. Significance of the campaign rests in the fact that the techniques developed at Sardinia may be the means for casting off the malarial yoke that retards economic development in all tropical areas.

In the United States, said the medical profession this year, malaria may now be considered "a diminishing and retreating disease." One of the notable areas where this statement applies is the Tennessee Valley. Here engineering principles of water-level management in reservoirs have had successful demonstration. Meantime, scientists working in Cuba report they may have a new weapon for fighting malaria. The device is simple enough—an amplifier through which the love-call of the mosquito is sounded surrounded by an electrified screen. Attracted by the siren call, the male mosquitoes are killed on contact with the screen and thus the cycle of egg fertilization is broken.

Waterworks Construction

AN ALL-TIME HIGH in dollar volume of waterworks construction was reached last year, according to ENR statistics. The total was $208 million, a fifty percent gain over the preceding year. Looking ahead, it is conservatively estimated that the prospects for this year are a 4 percent gain in dollar volume over the previous high.

This impressive amount of work reflects the demands that must be met to provide only the essential improvements. Present high costs and the hope that construction prices might soften are holding back many projects that otherwise would be put underway. At least this is the feeling of consulting engineers who report that the pressure put upon them by municipalities to prepare plans for construction has eased off considerably in recent months.

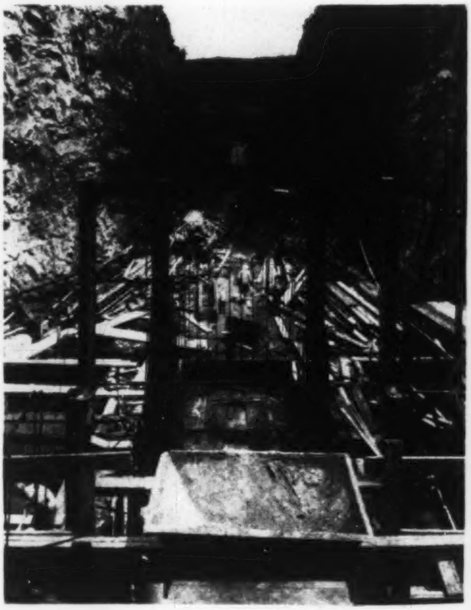
It is significant, however, that municipal voters in recent bond elections tend to approve waterworks proposals more often than other public works schemes. This would seem to indicate an awareness of the fact that procrastination in meeting increased water-consumption demands is poor policy. In this connection, the situation in Detroit illustrates a national trend. There the per capita consumption of water during the last decade has increased 17 percent—from an average of 125 gpd per capita to 146. Detroit has provided the money to take care of this increase, and more and more cities are ready to follow suit. Against such a background, reasonable optimism regarding waterworks construction does not seem to be misplaced.

Aids to Water Quality

ALONG WITH MORE WATER, better water quality represents a parallel unsatisfied demand, and here, too, favorable factors can be found.

Among the new developments in the field of water treatment that claim attention, none is of greater fundamental importance than the work at Harvard University relating to chlorine. In an interim report, the Harvard investigators have pointed to basically new concepts of the action of chlorine in water. These preliminary findings, which explain among other things how chlorine exerts its killing action on bacteria and how chlorine solutions are modified in their action by the presence of ammonia and other organic amines, promise new efficiency in water disinfection.

Also in the province of original research is the continuing study by Chicago municipal water experts in



DELAWARE AQUEDUCT water for New York will start its underground journey at this effluent channel and chamber in Roundout reservoir (background), 85 mi. northwest of the city.

SECOND MOKELUMNE AQUEDUCT in California. The new 67-in. concrete tube will permit transportation of the system's full capacity. Steel line at right is part of first aqueduct.

the application of the electronic microscope for rapid identification of bacteria. As stated in these pages a year ago, the Chicago authorities are seeking to determine if the microscope might supplement or even supplant the normal bacteriological methods employed and thus speed up water-quality test procedures. Latest reports reveal that the technicians are developing a high degree of correlation between visual examinations with the microscope and the bacteriological laboratory confirmations on certain types of bacteria.

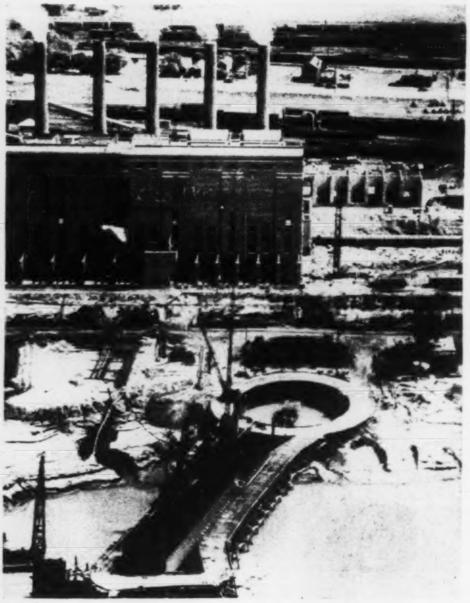
Outside the laboratory, water-treatment specialists are looking with interest upon two developments focused on filtration. One of these concerns the application of wartime work with small diatomaceous-earth filters to municipal water supplies. At Mounds, Illinois, an installation has been made looking toward treatment of the entire community supply with these special filters. Meantime, a British firm has completed negotiations with a U. S. water equipment company to market a filtering device based on principles of straining through a micro-mesh steel-wire cloth.

Refuse Problems

EVEN THOUGH a city may have two of its housekeeping problems—sanitation and water supply—under reasonable control, it is always faced with a third that challenges its ingenuity, namely refuse disposal. Currently, officials responsible for this municipal duty have a triumvirate of troubles: Greatly increased amounts of waste cast off by better-living households; severe shortages of labor; and a lack of collection equipment. Adequate funds would, of course, alleviate these troubles, but lacking these, as most cities do, experts feel that a better job might be possible through intensified sanitary education of the public, leading to greater cooperation between householders and the collection agency. Just how effective education can be in easing refuse collection was demonstrated last year in New York City where instruction in high schools, plus newspaper and radio publicity in one district produced significant improvement in street appearance and collection efficiency.

The greatly increased volumes of refuse to be picked up over extended areas point to the desirability of greater compaction in collection trucks. When heavier loads are secured, hauling costs may be expected to fall due to a reduction of trips to the disposal site. Equipment manufacturers are devoting much energy to the perfection of refuse compaction units, and there is a prospect that 1949 will witness great improvement in refuse collection efficiency.

Refuse disposal, too, is receiving increased attention, as attested by the fact that consulting engineers and equipment manufacturers are devoting much thought to better incineration. Both administrative efficiency and better furnace designs are involved. As an example of the former, incinerator "depots" are being



PRIVATE POWER DEVELOPMENT returned to prominence last year. This is the Venice, Ill. plant of Union Electric Co. where a 160,000 kw. addition is under way.

HUNGRY HORSE DAM construction proceeds through the Montana winter night with the aid of 1,500-watt floodlights strung on cables across the canyon.

built which include facilities for centralized control of refuse collection and disposal and better quarters for personnel. In operating techniques, some experts advocate application of industrial-type, materials-handling equipment to improve furnace feeding as well as to eliminate the disagreeable features of residue removal. In one plant, a push-button-controlled clamshell bucket running on an overhead monorail is being used successfully to feed several incinerators from a single receiving pit. Elsewhere, mechanical stoking of furnaces is making a strong bid to reduce manual-labor needs and increase cleanliness. The prevention of smoke and fly-ash nuisance promises to receive more engineering attention in the future. Considerable interest is also being shown in totally inclosed systems that will convey automatically-quenched ash from hoppers to outside dumps or temporary elevated storage. The trend towards still greater mechanization, which applies to new projects as well as remodeling of old incinerators, suggests eventual abandonment of the dirty, costly ash tunnel.

A rotary-kiln rubbish incinerator built in 1947 for Los Angeles, Calif. (ENR Dec. 12, 1946, vol. p. 793) has been accepted finally by the city. An explosion in the conveyor system between a shredder and the rotary kiln caused the delay. Some experts have concluded that excessive handling of heterogeneous rubbish from various sources—too much shredding and conveying before charging a furnace—is extremely dangerous practice.

One current move embraces development of legal authority and financial plans to permit construction and operation of a single incinerator that will economically serve several small, closely-situated communities. Refuse disposal is on the way to being recognized as one of the major problems of municipal management, and in 1949 substantial progress was recorded.

Much Power Development

POWER PLANT CONSTRUCTION, both steam and hydro, continued at an abnormally high rate through 1948, and as a result, in some areas, progress was made toward providing a safe margin between supply and demand. According to the Federal Power Commission U. S. power capacity increased some 8 per cent from 52,211,488 kw to 56,463,509 kw.

In most regions that depend largely on water for their power, low rainfall added to the shortages resulting from no power plant construction during war years. A spectacular example of this was Ontario, a province noted for its water-power resources, where it became necessary to shut down all but essential services for a few hours each day. In Northern California, where severe shortages were recorded last winter, more rain and snow during 1948 materially improved the supply. Prospects in California also have been improved by the great expansion program of the Pacific Gas & Electric Company. This year that program calls for expenditures averaging $12½ million a month. Throughout the nation all private utilities are engaged in extensive expansion plans, the aggregate totaling in the neighborhood of $2 billion dollars both last year and this.

In the Pacific Northwest the power situation remains critical, despite the great potential water power resources of the region. This is due in large measure to uncertainty over the government's future power program.

Power shortages in New England, New York and Ontario have increased demands for an early start on the development of the power resources of the international section of the St. Lawrence River.

St. Lawrence Power and Navigation

AS A RESULT of the increasing scarcity of power in regions that would benefit by development of more power on the St. Lawrence River, much of the opposition to public development of the International Rapids has disappeared. As a preliminary to such development, the New York State Power Authority and the Hydro Electric Power Commission of Ontario made application to the International Joint Commission for authority to proceed with the development work. However, as President Truman and other advocates of the St. Lawrence Seaway want action on both the enlarged ship canal and power development at the same time, the State Department is understood to have shelved the New York State application.

Opposition to modernization of the ship canal from Lake Ontario down to tidewater at Montreal also has diminished, due in large measure to the possibility of using that canal to bring iron ore from Labrador up into the Great Lakes to supplement the diminishing supplies of the Mesabi Range. In recent months some of the large iron and steel companies have come out in favor of the seaway.

As yet the new administration in Washington has not taken any definite step toward a start on the combined undertakings. Present indications are that when that step is taken it will be another attempt to get Congress to accept the agreement that was negotiated in 1941, but failed then to get approval. That agreement has acquired a certain amount of sacredness for some people because it was negotiated by the late President Roosevelt. Nevertheless, it never was a very satisfactory document, having some serious omissions, and now is badly out of date.

Reclamation Plans and Policies

NO DRASTIC CHANGES in reclamation policies are expected this year. The current appropriations request is a good indication of that. No money is asked for new projects. Some of the existing projects have been under way since 1938, and have yet to deliver significant quantities of water. That's reason enough to concentrate on the going jobs.

IRRIGATION WORKS. Throughout the West the Bureau of Reclamation continued to bring more water to thirsty lands. This is an inlet transition on the Friant-Kern canal in California's Central Valley project.

There are, however, some straws in the wind that may mean future changes. For example, the proposed Columbia Valley Authority, if Congress should authorize it, would presumably take over all federal reclamation activities in the far Northwest. Irrigation development, vital to the Northwest, has been a useful USBR function there. But the main reason behind the move to create such an authority is the desire by some to concentrate construction and operation of federal electric power works in one agency instead of having these functions spread among three. In contrast, there is some talk in California of an effort to get the operation of the Central Valley project under state jurisdiction. The state engineer's office developed the plan originally, but state officials couldn't arrange financing and the federal government stepped in. The Missouri Valley reclamation work, it seems certain, will continue to be master-minded by the Inter-Agency Committee.

Major Reclamation Works

CONSTRUCTION ACTIVITY on the part of the Bureau of Reclamation during 1948 again broke all records, and the outlook is for even greater activity. Although many projects are under way, more than 80 percent of current reclamation expenditures are centered in six big jobs, namely: California's Central Valley project, Washington's Columbia Basin project, the Colorado-Big Thompson project, the Missouri Basin projects, Hungry Horse Dam, and Davis Dam. Almost $200 million (not including possible deficiency appropriations) is available for these jobs during fiscal year 1949, and more than $300 million is proposed for fiscal year 1950. At his rate of expenditure, tremen-

FLOOD CONTROL ONLY. Between the steep rock banks of the north-flowing Genesee River 40 mi. south of Rochester, N. Y., the Army Engineers are building Mt. Morris Dam, a concrete gravity type 1,000 ft. long with spillway crest 165 ft. high.

dous quantities of new irrigation water will be available in increasing amounts, rising toward a peak in 1952.

The Central Valley project will stabilize the water supply for more than 1,000,000 acres. Colorado-Big Thompson will provide supplemental water for 615,000 acres, Columbia Basin will irrigate more than 1,000,000 acres of new land and the Missouri Basin will add another 750,000 acres in the next six years. That adds up to more than 3,000,000 acres to be made more productive in the near future with possible far-reaching effects on our national economy. Each of the large projects also includes power generation facilities, whose effect will be equally significant.

Work on California's Central Valley project is clouded by controversies regarding (1) the 160-acre limitation and (2) the contracts between the Bureau of Reclamation and the water users. The 160-acre limitation dispute is not likely to be resolved this year unless Congress takes unexpected action. However, an answer may well be found before delivery of significant quantities of water in 1952. The water contract dispute could easily be settled by inserting a clause guaranteeing renewal after the 40-year contract term. It is understood that reclamation officials are favorable to having legislation introduced to this effect.

Biggest Year in Missouri Valley

PEAK ACCOMPLISHMENTS were recorded last year by both the Bureau of Reclamation and the Corps of Engineers in their multi-million-dollar Missouri Valley flood-control programs. By the end of this June, both agencies will have obligated all of the $175,000,000 allotted them for this program under the Flood Control Act of 1944. Each is in a position to increase the tempo of its construction in the Missouri River Basin, if Congress authorizes sufficient appropriations in line with those requested by President Truman in his budget message last January.

Both the physical volume of work completed and the dollar volume of contracts awarded last year for flood-control and river development in the Missouri River Basin are impressive. The Bureau of Reclamation awarded contracts totaling $33,230,000 last year and, during the first eleven months of 1948, completed $68,000,000 of construction. Contracts for an additional $88,000,000 of work are expected to be let during the first half of this year. Ten major projects in the basin had percentages of completion last Jan. 1, ranging from 43 to 100 percent. Work will get under way on eight other important Bureau of Reclamation projects by June 30.

During 1948, over 35,000,000 cu. yd. of excavation was moved by contractors on Corps of Engineers projects in the Missouri River Basin. Contracts totaling $108,000,000 were in force last Dec. 1 and, one month later, the bulk of the $91,000,000 appropriated for Corps of Engineers projects in the basin, had been obligated. Some of the larger dams—notably Garrison, Fort Randall, Harlan County and the Cherry Creek Dam, Denver—were in their third year of construction.

With the large number of big dams and river development projects currently under way, together with those ready to be started, 1949 promises to be an even bigger construction year in the Missouri River Basin.

Flood-Control Progress

ALTHOUGH the flood-control dams of the Missouri River basin have received most attention because of their size, good progress is being made by the Army Engineers in other river basins, especially in the Ohio River valley where a number of large reservoirs on tributary rivers such as Bluestone, Dillon, Delaware and Conemaugh are or soon will be available to hold back flood waters. Much the same can be said about the Arkansas and White rivers, major contributors to floods in the lower Mississippi valley. Among there are Ft. Gibson and Bull Shoals reservoirs. However, a large amount of similar work remains to be done on these and other rivers before reasonable protection against all but major floods will be provided. Also, as some areas cannot be protected by reservoir storage alone, many miles of floodwalls or levees are required. That work also is making steady progress.

Water Rights Compacts

SOME PROGRESS and much history was made during the past year on three important water rights compacts involving the Arkansas, the Upper Colorado, and the Lower Colorado rivers.

For 70 years water of the Arkansas River has irrigated lands in Colorado and Kansas, and during much of that time there have been questions, disputes and litigation between claimants. A real milestone of progress was passed late in 1948 when after long preliminaries, via U. S. Supreme Court decision and Congressional action, an interstate compact was signed. The agreement makes provision for joint-interest conservation on the Arkansas River with interstate allocations under jurisdiction of a Compact Administration.

Unfortunately, this degree of accomplishment cannot be recorded for the Colorado River, where agreement between the interested states is of much greater significance from a national viewpoint. During 1948 the five states of the upper basin did reach agreement on a compact for allocation of the available water and, so far, the legislatures of four states have ratified the compact. But, in contrast, no progress was made toward agreement among the states of the lower basin. The two states most deeply concerned, Arizona and California, appear to be farther apart than ever, due chiefly to the introduction in Congress last year of two bills having an important bearing on the controversy. One, sponsored in California, seeks to have the U. S. Supreme Court adjudicate the controversy over the terms of the Colorado River Compact, and the other would authorize large federal expenditures on a scheme for pumping 1,200,000 acre-ft. of Colorado River water annually into central Arizona to supplement existing irrigation supplies there.

ALATOONA DAM, federal project on the Alabama-Coosa river in Georgia, will protect the city of Rome from floods and develop 72,000 kw. of electric power.

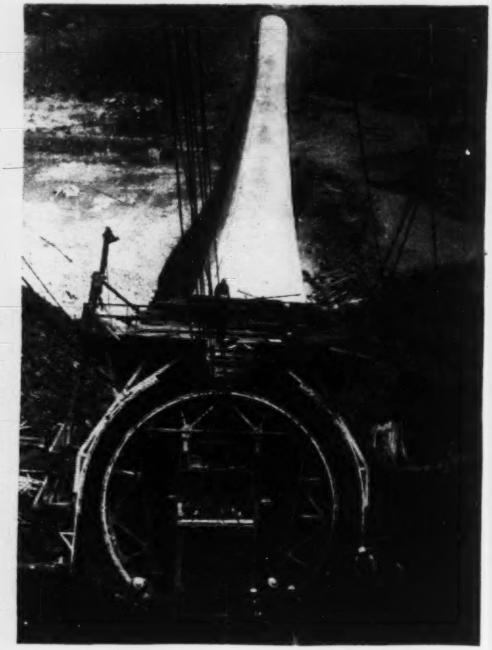
Professional Problems

PROFESSIONAL PROBLEMS in 1948 were largely financial. Increases in the operating costs of the professional societies were not offset in increases in membership, making curtailment of activities or higher dues necessary. When a second attempt to raise the dues of members of the American Society of Civil Engineers failed the society closed its Los Angeles and Chicago offices and cut the operating cost of its Washington office.

Engineering work, both public and private, continued at a high rate throughout the year. As a result, employment conditions were good. In highway work there was a serious deficiency of engineers, due in large measure to the lower rates of pay in comparison to private industry.

No serious labor troubles arose. A strike among Ebasco engineering employees at New York, which began in the latter part of 1947, petered out early in 1948, and the union is no longer recognized there. In the west, the National Professional Association of Engineers, Architects and Scientists completed its organizational work. It is made up of five independent collective-bargaining groups, some of which were started initially under ASCE auspices.

As this year opened both the National Society of Professional Engineers and the Engineers Joint Council



CONSTRUCTION INGENUITY. Interior and exterior form travelers for this siphon on the Columbia Basin project are drawn to new positions up the slope by wire-rope tackle.

were taking steps to see what could be done toward retaining for engineering employees the independent status granted them under the Taft-Hartley Act when Congress comes to repeal or amend that measure.

Advances in Construction Techniques

INVENTIVE THOUGHT of contractors, engineers and manufacturers brought to the construction field a normal crop of new ideas during 1948. Most were of indisputable value; others were controversial or primarily speculative.

One proposition that no longer remained speculative was construction in the open sea. Contractors built a pile-supported 206 x 110-ft. oil drilling platform, complete with shop and housing facilities, in 48 ft. of water eight miles off the Louisiana coast.

And dreams of a continuous-tunneling machine received new support with the development of two machines that chew on coal seams, without pause for mucking. In the meantime, however, the tunneling fraternity was content with more refinements of traditional methods. Both drilling and mucking benefitted. One manufacturer cadmium-plated the friction parts on drills, to reduce lubrication and eliminate rust. The detachable drill bit, itself a comparatively recent development, was in the middle of a controversy that arose with the introduction of carbide-insert bits and of throw-away bits. Cost-saving was argued in favor of both innovations, but the question is not yet resolved. Mucking versatility was broadened by an oxygen-admixing device that changed carbon monoxide to carbon dioxide, so that shovels and trucks powered by internal combustion engines could work underground. In open blasting, millisecond delayed-action caps enabled contractors to cut rock with better fragmentation and less shock.

Elsewhere above ground, the stud-welding gun found many new uses. A notable application took place on the huge all-welded crib of Cleveland's Nottingham water intake, where 20,000 metal lath studs were shot on steel-plate surfaces to be gunited. For this same job, single sections of reinforced concrete pipe were poured in a vertical position to a height of 24 ft., a feat that was duplicated in Los Angeles. That city's Hyperion sewer job also included the year's most spectacular conduit-casting technique—building 455-ton outfall sections 100 ft. long. Thirty-two of these were poured in a horizontal position on shipways, side-launched and floated to position for sinking. In Canada, 84-in. dia. pipe, fully prestressed and without steel diaphragms, was manufactured for a new Montreal water intake. For Davis dam concrete, engineers sought to avoid deleterious effects of alkali aggregates by admixing pozzolanic materials. Ice cooled this concrete, as it cooled the concrete of a few other new dams in warm climates. At Bull Shoals dam aggregates were chilled in icy water before they were mixed, and an unconventional cofferdam, of concrete, was built to withstand overtopping by floods.

In another department, earth, developments followed a pattern established in recent years by the science of soil mechanics. For compaction of granular materials one manufacturer introduced a 30-ton vibrating roller. Vertical sand drains, developed earlier for hastening consolidation of unstable soils, were specified on several new jobs. And earthmoving contractors who had planned to dig and carry 14,000,000 cu.yd. of sand dunes on a California project had their eyes opened by the method of the winning bidder. He sluiced down the dunes and pumped to the spoil area—a badly eroded beach that needed rebuilding.

Another ingenious earthwork method—auger-boring for structural footings—enabled a California contractor to bid 25 percent under his competitors on a New Jersey building foundation job. The price included a transcontinental round trip for rig and crew. Also, on a Texas expressway project the contractor bored 30-in. holes 40 ft. deep, then belled them out to 7½ ft. for overpass concrete column footings. This equipment, usually truck-mounted, can bore holes up to 72 in. dia.

All these examples of initiative and ingenuity are indicative of the revival of "Normal" times in construction. It is a good omen for 1949.

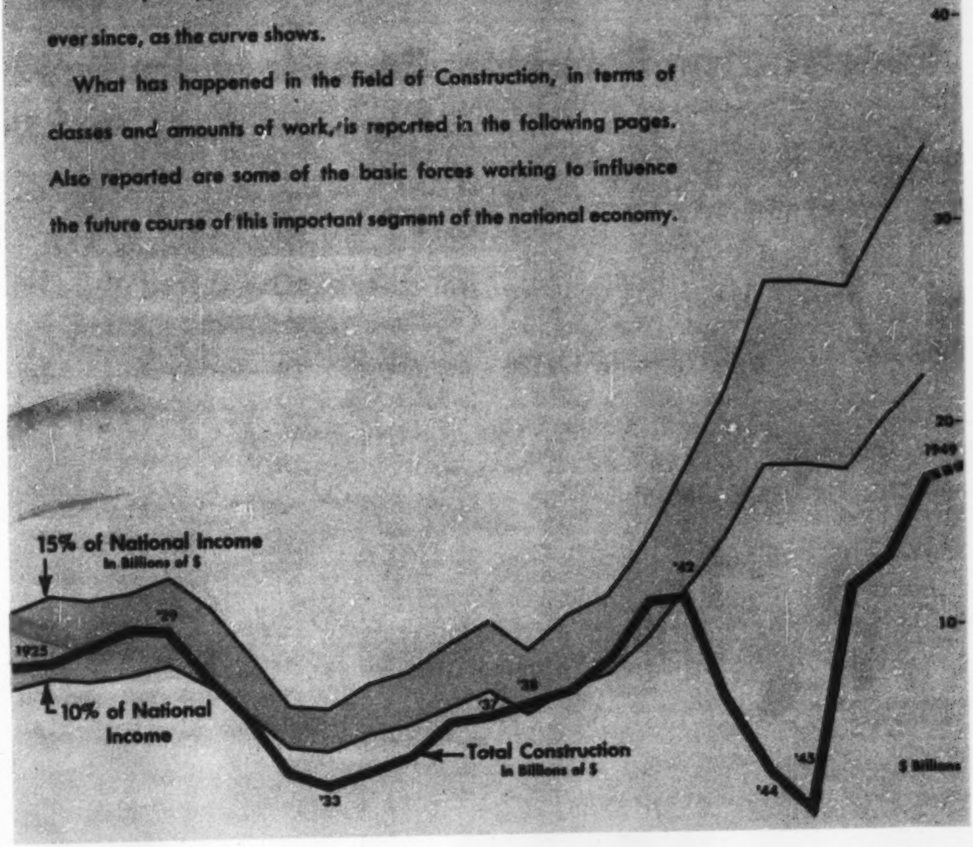
CONSTRUCTION

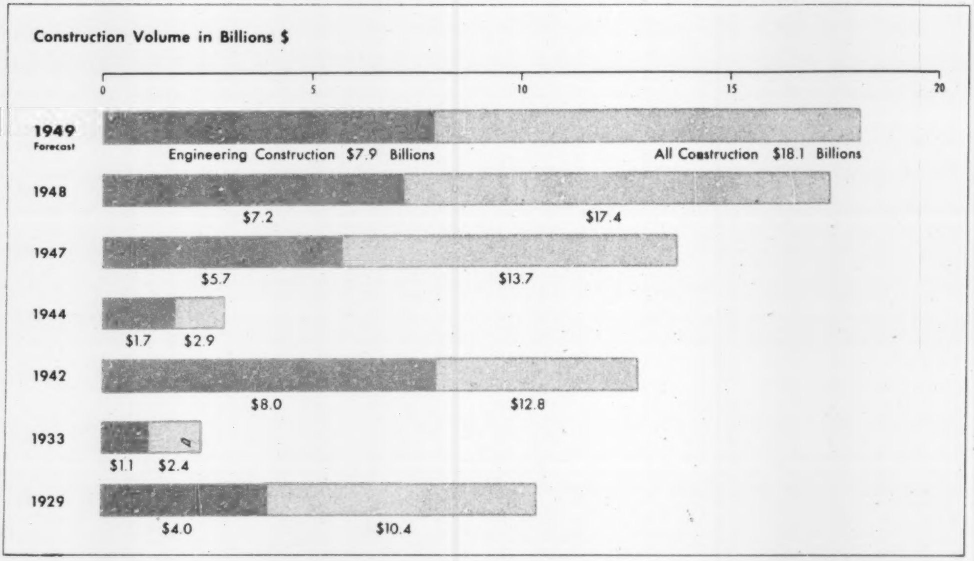
FACTS AND FIGURES

★

Construction's share of the national income is again rising toward the 10 percent figure that, historically, has been associated with a prosperous peacetime economy. Dislocated during the war this relationship dropped to 3 percent in 1944. It has climbed steadily ever since, as the curve shows.

What has happened in the field of Construction, in terms of classes and amounts of work, is reported in the following pages. Also reported are some of the basic forces working to influence the future course of this important segment of the national economy.





Construction Sets New Records in Dollars

Construction of all kinds pushed over the $17 billion mark in 1948 and is heading for an estimated $18 billions in 1949. Engineering construction projects reported by ENGINEERING NEWS-RECORD topped $7.2 billions in volume of new work started, are heading for $7.9 billions, a 10 percent increase. The previous record was $8 billions in 1942.

That there is ample work proposed to support a substantial increase in construction this year is evident from the size of ENR's measured backlog of construction which stood at $43.2 billions at the close of 1948. This backlog of proposed projects would support six years of heavy construction at the 1948 volume rate.

Engineering construction was 25 percent higher in 1948 than in 1947, 55 percent higher in New England, 27 percent in Middle Atlantic, 8 in the South, 11 in Mid-West, 38 in West of Mississippi states, 27 percent in the Far West.

Housing starts, totaling 926,800, topped 1947 but fell off sharply in the fourth quarter. Commercial building, including private mass housing, was the only loser in 1948, dropping 2 percent. Industrial building, including public utilities, increased 25 percent, public buildings 85 percent, waterways and reclamation 56 percent, bridges 51, waterworks 47, sewerage 28, highways 23 and unclassified 23 percent.

New capital to finance construction increased 73 percent.

The facts and figures behind these highlights are reported graphically in the following pages.

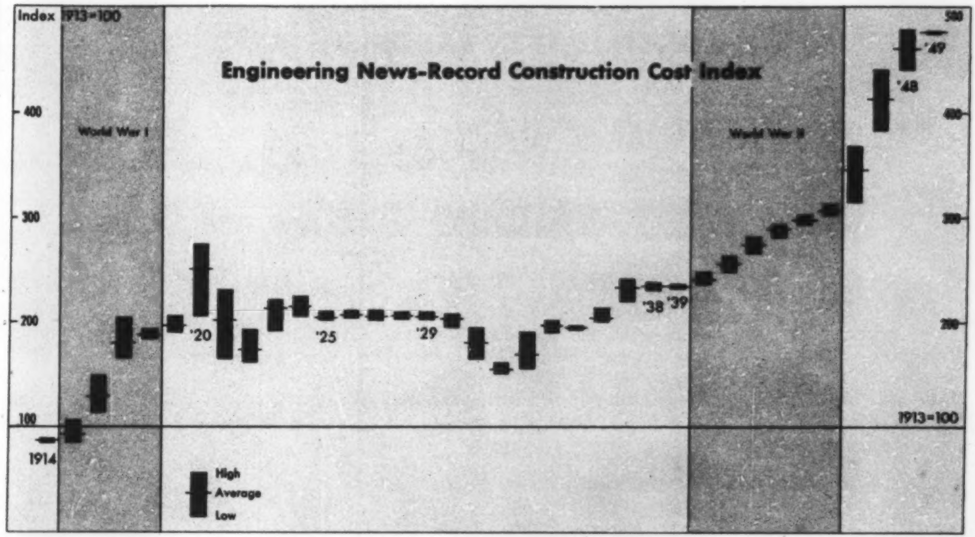
Table I. Construction Volume Analysed

	All Construction			Engineering Construction		
	Estimated by Engineering News-Record			As reported		ENR Volume
	Public	Private	Total	by ENR	In 1939 $	Index 1913-100
1949 Forecast	$5,900,000,000	$12,170,000,000	$18,070,000,000	$7,914,000,000	$3,900,000,000	275
1948	5,253,000,000	12,126,000,000	17,379,000,000	7,219,000,000	3,682,000,000	254
1947	3,643,000,000	10,034,000,000	13,677,000,000	5,659,000,000	3,318,000,000	228
1944 War Low	1,815,000,000	1,085,000,000	2,900,000,000	1,730,000,000	1,363,000,000	96
1942 War High	11,061,000,000	1,760,000,000	12,821,000,000	8,006,000,000	6,826,000,000	480
1939	3,750,000,000	3,224,000,000	6,974,000,000	3,003,000,000	3,003,000,000	211
1933 Dep. Low	1,533,000,000	907,000,000	2,440,000,000	1,068,000,000	1,480,000,000	102
1929*	3,263,000,000	7,114,000,000	10,377,000,000	3,950,000,000	4,500,000,000	317

*High for recorded engineering construction; 1928 was $203,000,000 higher for estimated total

Table II. Construction Volume Forecasts for 1949 Compared

Forecaster Basis	1948	1949	% Rise
Engineering News-Record, estimated total contracts awarded and work started by day labor	$17,379,000,000	$18,070,000,000	4
Engineering News-Record, recorded engineering construction contracts and work started	7,219,000,000	7,914,000,000	10
Dept. of Commerce & Bureau of Labor Statistics, joint estimate of total construction put in place	17,775,000,000	18,750,000,000	5
Producers Council, estimated total construction put in place	18,000,000,000	18,175,000,000	1
F. W. Dodge (37 Eastern States), estimated 37-state total contracts	9,655,000,000	9,430,000,000	−2



High Costs—Construction's Biggest Problem

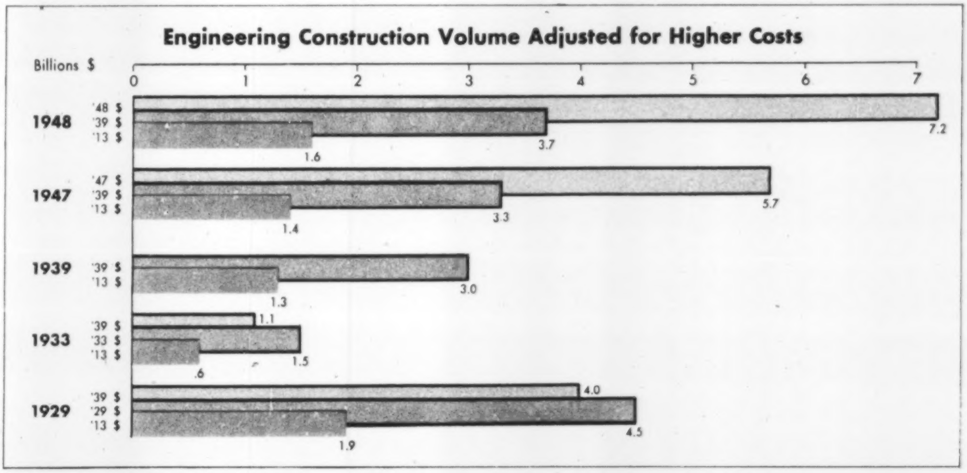
Construction accomplishments, in the dollars just reported, are somewhat deflated when measured in prewar construction dollars. Thus 1948 dollar volume is 60 percent higher than 1929. But in 1939 construction-dollars, 1948 volume is 18 percent below 1929.

Costs of construction materials and labor in 1948, climbed to double their 1939 rates, so dollars spent bought only half as much construction as their prewar ancestors. In November, however, costs started down, gently, for the first sustained lowering and leveling movement since 1938-39. Lumber, which (with labor) led the ascent, is now responsible for reversing the trend.

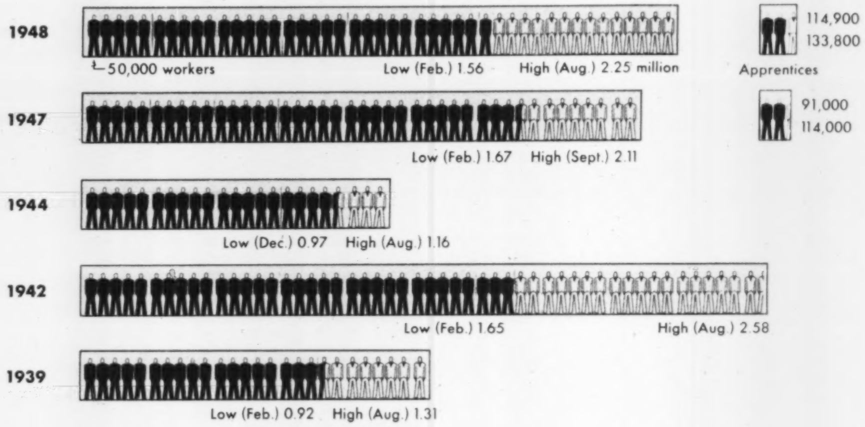
Behind these improvements in the cost picture were improved supplies of materials and equipment, also more experienced workers with resulting improvement in labor and job productivity. The principal shortages remaining were structural steel, pipe and plate, cement (on the borderline), tractors, heavy power shovels and cranes and heavy graders.

Lumber production and plywood caught up with the market, and prices tumbled. This was largely due to the declining number of new starts of housing units in the fourth quarter. Here drastic reduction in prices per housing unit is needed to pick up housing construction volume by building for the mass, or lower income market.

More details, and dollars and cents values, for these many influences on construction activity are reported graphically in the following pages.

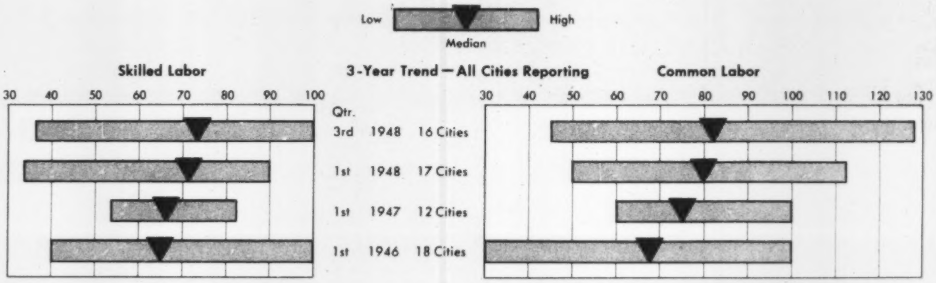


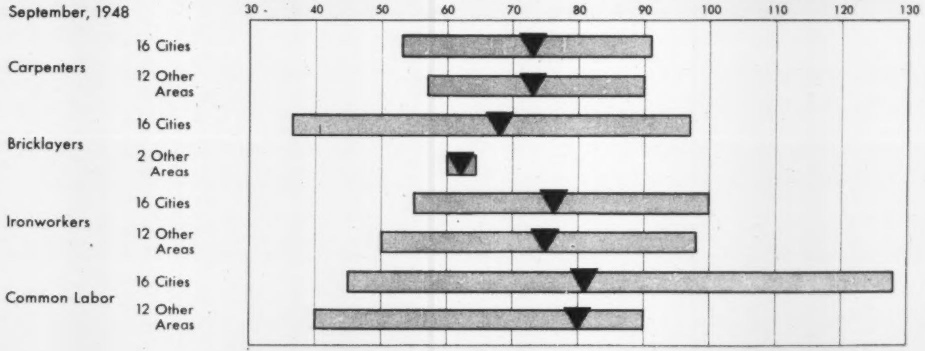
CONSTRUCTION LABOR SUPPLY

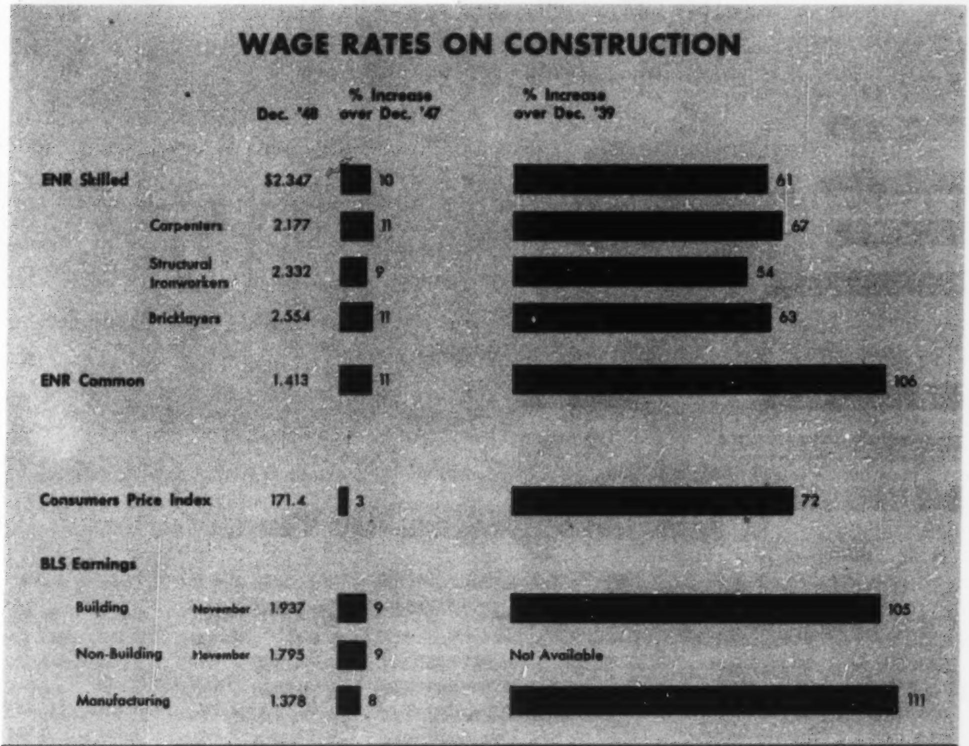


CONSTRUCTION LABOR PRODUCTIVITY ON BUILDINGS

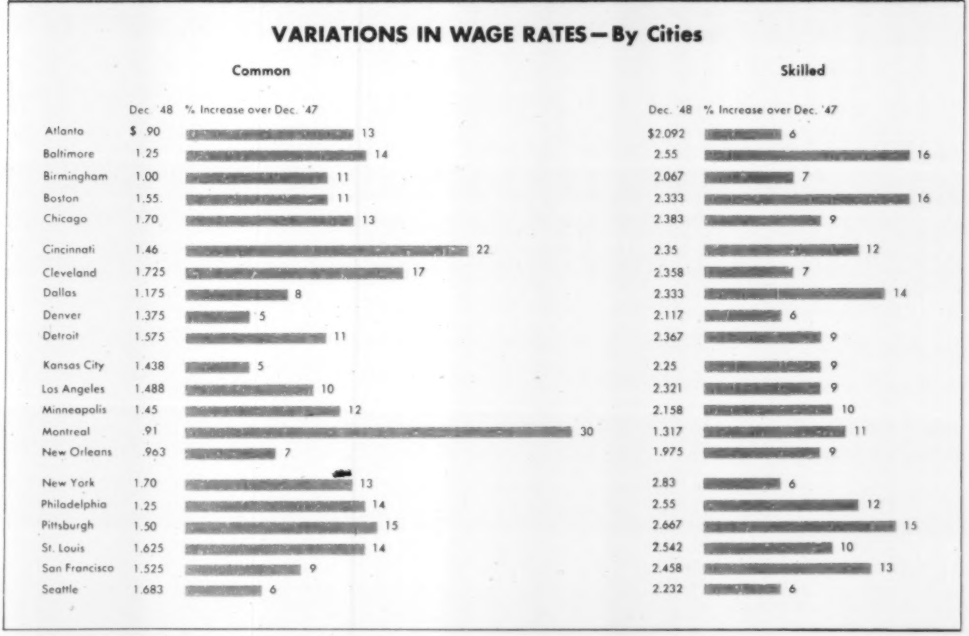
As Reported by Building Contractors to Engineering News-Record 1939 = 100







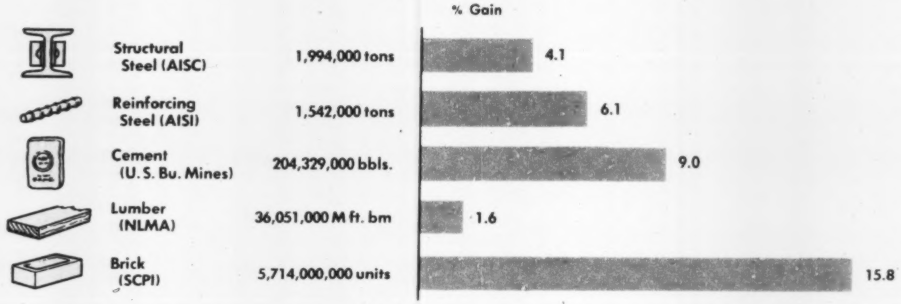
WAGE RATES ON CONSTRUCTION



VARIATIONS IN WAGE RATES—By Cities

CONSTRUCTION MATERIALS SUPPLY

Gains in 1948 over 1947 shipments



Material Shipments—By Years

Item	Unit	1929	1933	1939	1942	1945	1947	1948
Lumber	Millions Bd. Ft.	35,952	16,300	25,811	38,946	28,869	35,500	36,051
Cement	Thous. Bbl.	169,868	64,283	122,651	185,267†	106,398†*	187,395§	204,329§
Fabr. Str. Steel	Thous. Tons	3,307	828	1,440	2,040	797‡	1,915	1,994
Reinf. Steel	Thous. Tons	1,079	409	1,214	1,845	835	1,453	1,542
Explosives	Thous. Lbs.	509,708	255,987	372,470	427,744	440,208	634,829	665,524
Brick	Million Brick	....	860	3,319	2,929	2,375	4,934	5,714

†*Includes Puerto Rico and Hawaii *from May through December. §Includes Puerto Rico. ‡Bridges and buildings only, representing approximately 80% of the industry. A.I.S.C. discontinued estimated shipments data for entire industry during war years.

Production Index for Selected Construction Materials

Unadjusted—1939 Monthly Average=100

U. S. Dept. of Commerce

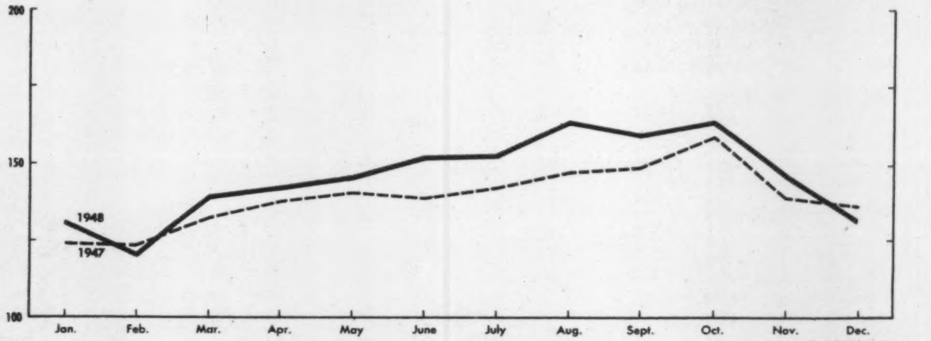
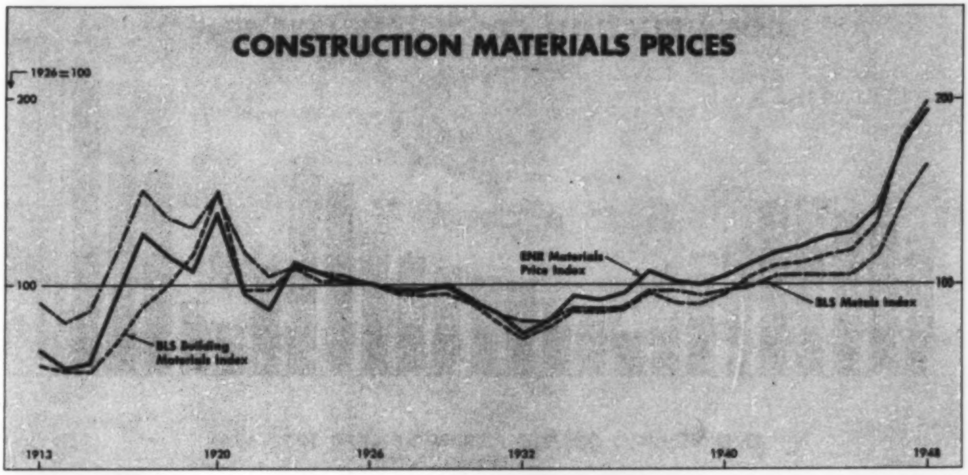


Chart ENR Business News

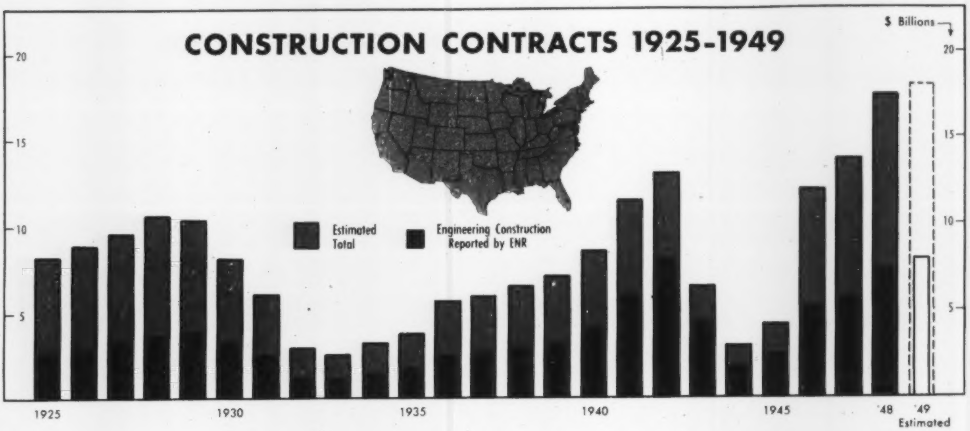


PRICE RANGES—1948

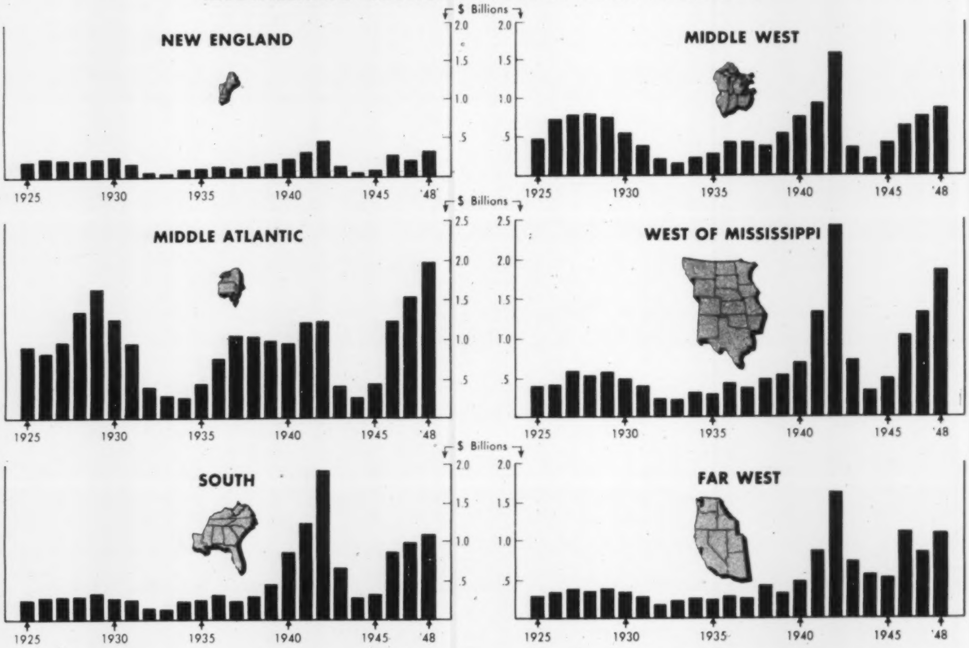
	Dec. 1948	% Incr. Over Dec. 1947	% Incr. Over Dec. 1939
Structural Steel	$3.25	16	57
Cement	2.96	12	38
Lumber	88.08	−4	164
Brick	27.34	13	90
Sand	1.98	12	65
Struct. Clay Tile	128.40	6	74
Ready-Mixed Concr.	10.21	9	44

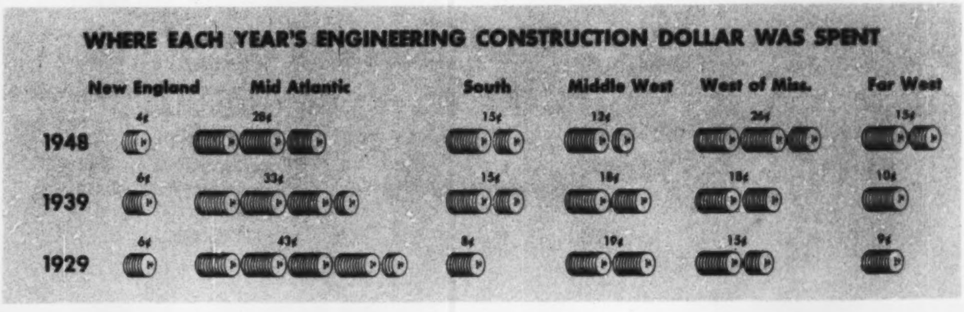
VARIATIONS IN PRICE —By Cities

	Lumber Dec. 1948	Lumber % Change Over Dec. 1947	Bulk Cement Dec. 1948	Bulk Cement % Change Over Dec. 1947
Atlanta	$60.00	−24	$3.05	8
Baltimore	103.50	−1	3.06	15
Birmingham	75.00	−16	2.74	12
Boston	88.50	1	3.40	10
Chicago	86.00	−11	2.59	−4
Cincinnati	105.00	11	2.94	11
Cleveland	73.00	−25	2.82	11
Dallas	61.00	5	2.52	2
Denver	110.00	14	3.29	10
Detroit	79.00	−13	2.92	17
Kansas City	104.00	−3	2.99	14
Los Angeles	88.00	−15	3.34	11
Minneapolis	111.00	3	3.00	7
New Orleans	70.50	−8	2.75	18
New York	93.13	−14	4.10†	9
Philadelphia	107.38	−7	3.10	26
Pittsburgh	93.75	28	3.10	29
St. Louis	109.75	.2	2.75	5
San Francisco	73.00	−5	2.98	13
Seattle	70.00	0	2.95	5



ENGINEERING CONTSRUCTION BY AREA 1925-1948





ENGINEERING CONSTRUCTION CONTRACTS AWARDED IN 1948

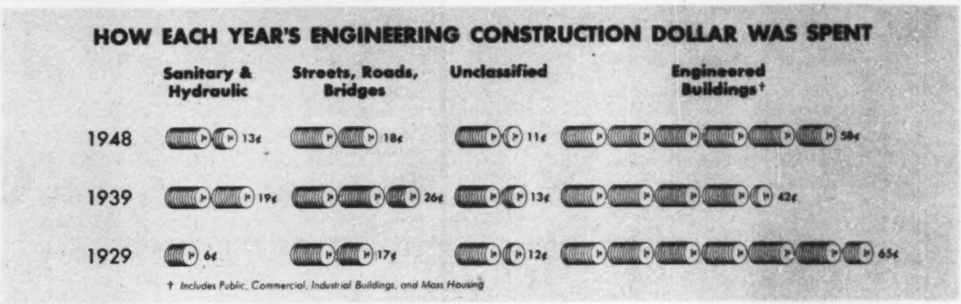
AS REPORTED TO ENGINEERING NEWS-RECORD

Construction projects of the following costs—waterworks, excavation and irrigation, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

Thousands of Dollars (000 Omitted). Computed on Weekly Averages.

	Public Works Contracts								Private Contracts			Construction				
States	Water-works	Sewer-age	Bridges	Earthwork Irr.-Drain.	Streets, Roads	Build-ings	Un-classified	Federal Gov't. Work	Indus-trial Bldgs.	Com-mercial Bldgs.	Un-classified	Private	Public	1948 TOTAL	1947 TOTAL	% Change 1947 to 1948
UNITED STATES																
1948	**208,658**	**227,762**	**302,655**	**519,463**	**995,819**	**1,161,262**	**231,467**	**951,229**	**1,095,581**	**1,888,480**	**588,240**	**3,581,444**	**3,637,943**	**7,219,387**		
1947	139,141	174,764	196,297	326,856	794,133	615,492	245,822	656,419	862,205	1,897,961	406,561	3,167,801	2,491,431		5,659,232	
% Change	+47	+28	+51	+56	+23	+85	−8	+42	+25	−2	+42	+11	+43			+ 25
NEW ENGLAND																
1948	**14,624**	**7,182**	**29,393**	**5,884**	**43,387**	**85,022**	**19,264**	**15,707**	**38,470**	**77,334**	**2,338**	**118,142**	**204,756**	**322,898**		
1947	2,119	2,939	11,395	5,739	24,632	20,503	21,692	25,791	42,155	71,358	1,480	114,993	89,019		204,012	
% Change	+573	+139	+153	+1	+73	+307	−13	−40	−10	+6	+57	+1	+126			+ 55
Maine			2,011	1,037	2,649	339		1,112			150	150	6,036	**6,186**	18,951	− 68
New Hampshire	60		1,250	1,224	7,599	9,370		5,042	124			124	19,503	**19,627**	3,926	+386
Vermont			94		2,153	2,147	549	469		1,000		1,000	4,943	**5,943**	3,197	+ 84
Massachusetts	13,317	2,363	19,039	773	14,798	32,977	15,207	1,832	7,809	23,542	1,043	32,394	98,474	**130,868**	50,737	+152
Rhode Island	174	1,860	53	791	2,641	5,593	2,340	1,680	2,683	10,345	550	13,578	13,452	**27,030**	27,981	− 5
Connecticut	1,073	2,959	6,946	2,059	13,547	34,596	1,168	5,572	27,854	42,447	595	70,896	62,348	**133,244**	99,220	+ 32
MIDDLE ATLANTIC																
1948	**64,959**	**31,811**	**93,313**	**60,205**	**221,794**	**298,407**	**48,398**	**164,708**	**175,082**	**877,652**	**119,232**	**1,176,691**	**814,162**	**1,990,853**		
1947	32,996	34,505	41,253	25,893	143,819	176,757	48,871	115,384	215,804	797,689	19,008	1,032,594	504,001		1,536,595	
% Change	+93	−10	+122	+128	+51	+66	−3	+40	−20	+8	+515	+12	+59			+ 27
New York	43,556	15,307	30,988	25,426	68,002	154,726	18,805	58,128	21,305	291,990	10,330	420,740	352,695	**773,435**	493,810	+ 54
New Jersey	646	1,425	14,672	2,915	17,003	26,090	2,260	17,519	24,792	82,776	885	109,063	64,371	**173,434**	226,503	− 25
Pennsylvania	8,386	10,827	20,944	29,532	103,581	71,619	17,065	63,034	72,466	338,506	13,388	424,360	261,954	**686,314**	677,979	− 1
Maryland	11,469	3,161	12,573	2,065	27,221	22,905	9,103	10,309	24,003	125,570	744	150,317	88,497	**238,814**	66,306	+253
Dist. of Columbia	902	1,091	2,874	94	1,431	15,164	1,165	7,944	510	6,167		6,677	22,721	**29,398**	32,271	− 10
Delaware			11,262	173	4,556	7,933		7,774	32,006	32,643	885	65,534	23,924	**89,458**	39,726	+121
SOUTH																
1948	**29,182**	**34,249**	**57,585**	**86,308**	**195,589**	**185,143**	**37,402**	**149,175**	**165,655**	**205,397**	**84,176**	**458,255**	**622,431**	**1,080,686**		
1947	18,122	20,599	44,405	83,339	185,989	99,096	47,049	145,598	107,116	304,584	68,283	480,056	498,526		978,582	
% Change	+58	+63	+27	+2	+3	+83	−22	+1	+52	−34	+21	−6	+22			+ 8
Virginia	1,989	1,323	3,862	24,219	11,598	16,727	6,255	33,703	4,574	16,612	1,186	22,372	65,973	**88,345**	74,058	+ 17
West Virginia	87		1,714	7,341	7,004	12,215	1,276	18,090	2,242	2,865	7,700	12,807	29,637	**42,444**	34,171	+ 22
North Carolina	6,005	3,743	3,698	723	23,333	11,845	1,338	1,415	11,989	10,216	2,928	25,133	50,685	**75,818**	80,795	− 8
South Carolina	1,110	2,138	3,394	2,308	16,944	4,171	1,448	3,069	28,411	12,264	3,103	43,778	31,513	**75,291**	64,252	+ 15
Georgia	3,296	1,881	6,014	3,004	28,404	9,539	4,911	4,367	17,673	36,376	8,401	62,450	57,049	**119,499**	124,286	− 6
Florida	6,967	4,835	7,362	4,689	10,088	23,853	4,139	8,371	17,577	57,735	11,562	86,874	61,933	**148,807**	178,097	− 18
Alabama	1,479	5,048	2,504	580	9,645	10,827	5,112	1,652	55,552	11,738	4,993	72,333	35,145	**107,478**	63,144	+ 66
Mississippi	1,492	1,267	1,239	4,180	14,956	11,892	1,854	6,821	2,151	2,393	7,575	12,119	36,880	**48,999**	57,796	− 17
Louisiana	1,883	9,255	12,689	28,469	20,312	27,793	7,015	29,403	10,182	28,685	11,181	50,188	102,276	**152,464**	134,204	+ 11
Kentucky	1,620	4,043	10,360	6,942	16,911	13,070	4,565	16,116	7,534	8,577	8,831	27,779	54,674	**82,453**	83,572	− 3
Tennessee	3,254	716	4,749	3,853	36,394	43,211	4,489	26,168	7,770	17,936	16,716	42,422	96,666	**139,088**	84,207	+ 62
MIDDLE WEST																
1948	**24,610**	**38,938**	**33,816**	**15,376**	**155,316**	**151,112**	**21,698**	**48,251**	**227,622**	**123,556**	**67,505**	**418,983**	**440,566**	**859,549**		
1947	22,361	57,095	27,920	33,947	133,993	82,960	28,233	50,477	142,213	150,201	79,708	372,640	385,991		758,631	
% Change	+8	−33	+19	−56	+14	+79	−25	−6	+57	−19	−17	+10	+12			+ 11
Ohio	11,057	2,245	4,988	4,118	45,001	28,004	7,284	9,621	92,146	57,315	41,745	191,206	102,797	**294,003**	179,696	+ 61
Indiana	1,712	2,166	6,282	1,220	18,765	28,228	2,179	7,991	20,298	14,911	3,643	38,852	60,562	**99,414**	85,630	+ 14
Illinois	4,969	16,513	9,615	9,563	39,528	41,804	9,412	13,742	71,623	37,652	5,865	115,440	131,104	**246,544**	279,389	− 13
Wisconsin	1,879	8,482	5,324	125	29,828	26,612	2,472	293	30,681	11,928	14,428	57,037	74,722	**131,759**	119,145	+ 9
Michigan	4,993	9,532	7,607	350	22,194	26,454	251	16,604	12,874	1,750	1,824	16,448	71,381	**87,829**	94,771	− 9
WEST OF MISSISSIPPI																
1948	**48,716**	**48,674**	**44,156**	**234,564**	**265,272**	**258,262**	**51,800**	**359,715**	**243,129**	**385,717**	**293,460**	**923,397**	**950,353**	**1,873,750**		
1947	27,478	34,923	44,457	134,020	217,433	123,036	44,312	210,411	249,519	255,585	204,551	710,045	625,269		1,335,314	
% Change	+74	+37	−3	+72	+20	+106	+15	+68	−4	+48	+41	+28	+49			+ 38
Minnesota	1,147	4,192	2,595	1,818	19,916	13,352	2,059	2,454	12,161	13,428	5,829	31,517	44,980	**76,497**	69,641	+ 8
Iowa	2,569	2,424	7,118	4,938	21,724	14,666	2,675	5,229	11,518	13,479	4,115	29,112	56,114	**85,226**	56,169	+ 49
Missouri	2,372	2,976	6,585	12,080	15,644	22,978	3,092	23,076	15,648	31,361	16,970	64,118	65,588	**129,706**	138,593	− 8
Arkansas	855	249	2,170	17,479	1,750	14,360	2,087	29,471	7,274	1,050	5,985	14,588	38,671	**53,259**	97,265	− 46
North Dakota	1,346	1,034	579	19,084	13,381	4,223	983	23,000	4,163		4,567	8,829	40,531	**49,360**	33,482	+ 45
South Dakota	350	1,244	890	10,985	12,945	5,593	1,792	17,757	492	1,010	3,528	5,030	33,799	**38,829**	24,072	+ 59
Nebraska	1,150	1,194	188	30,680	13,566	20,019	4,472	42,927	5,648	7,623	6,799	20,070	71,269	**91,339**	38,102	+135
Kansas	1,944	2,442	2,553	8,342	22,653	6,477	3,447	10,483	8,937	17,432	12,110	38,479	47,858	**86,337**	79,556	+ 6
Oklahoma	13,564	6,905	3,732	8,008	19,695	15,636	1,491	11,218	16,661	11,377	19,700	47,738	69,031	**116,769**	75,672	+ 51
Texas	17,064	22,354	11,597	47,341	76,799	78,661	22,239	61,770	140,776	278,050	202,103	621,004	275,980	**896,984**	552,424	+ 59
Montana	431	2,283	3,320	61,122	11,563	13,825	815	73,246	295	4,277	2,015	6,987	93,059	**100,046**	42,682	+130
Wyoming	710	322	751	4,397	10,342	7,153	1,010	8,992		1,101	5,414	6,515	24,685	**31,200**	38,909	− 21
Colorado	3,680	400	1,986	6,993	14,254	12,446	3,653	19,056	18,208	4,308	2,300	24,816	43,412	**68,228**	57,650	+ 16
New Mexico	1,534	555	92	1,297	11,040	28,873	1,985	31,036	1,348	1,221	2,025	4,594	45,376	**49,970**	31,097	+ 58
FAR WEST																
1948	**26,567**	**66,908**	**44,392**	**117,126**	**114,461**	**183,316**	**52,905**	**213,673**	**245,623**	**218,824**	**21,529**	**485,976**	**605,675**	**1,091,651**		
1947	36,065	24,703	26,867	43,918	88,267	113,140	55,665	108,758	105,398	318,544	33,531	457,473	388,625		846,098	
% Change	−28	+166	+62	+162	+27	+59	−7	+93	+129	−33	−37	+4	+53			+ 27
Idaho	351	1,564	627	4,937	8,432	3,303	294	9,118	13,370	4,083	507	17,960	19,508	**37,468**	30,442	+ 21
Utah	740	566	225	4,556	5,474	7,211	2,924	6,808	26,308	4,850	537	31,695	21,696	**53,391**	29,408	+ 78
Arizona	72	500	1,823	3,115	6,146	1,968	9,697	13,855	8,300	945	100	9,345	22,661	**32,006**	12,299	+155
Nevada	511	150	1,118	2,372	4,455	2,401	2,405	6,864	125	1,600		1,725	13,412	**15,137**	12,986	+ 14
Washington	2,440	6,370	17,656	33,049	15,291	68,478	9,101	70,024	12,635	31,997	3,930	48,562	152,170	**200,732**	146,023	+ 35
Oregon	2,149	3,519	4,027	32,572	13,574	28,494	4,397	57,939	8,474	14,822	2,057	25,353	88,947	**114,300**	70,259	+ 60
California	20,304	54,239	18,916	36,525	61,089	71,521	24,687	49,065	176,411	160,527	14,398	351,336	287,281	**638,617**	544,681	+ 15
CANADA																
1948	**8,379**	**10,948**	**6,521**	**10,517**	**35,678**	**139,784**	**42,021**		**166,158**	**91,539**	**68,805**	**266,552**	**253,798**	**520,350**		
1947	8,638	6,320	7,231	24,853	39,072	86,505	28,466		126,438	70,527	48,419	254,634	201,045		446,679	
% Change	−5	+70	−12	−58	−10	+58	+45		−18	+27	+39	+6	+24			+ 14

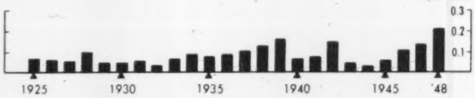
ENGINEERING CONSTRUCTION VOLUME—BY CLASS OF WORK



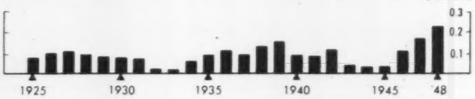
HOW EACH YEAR'S ENGINEERING CONSTRUCTION DOLLAR WAS SPENT

† Includes Public, Commercial, Industrial Buildings, and Mass Housing

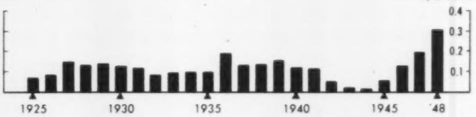
WATERWORKS



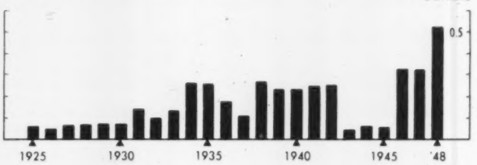
SEWERAGE



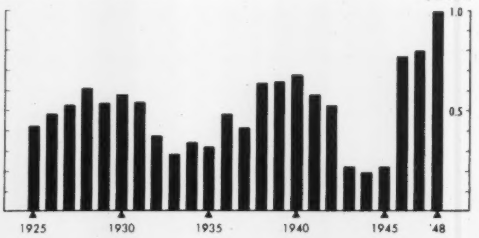
BRIDGES



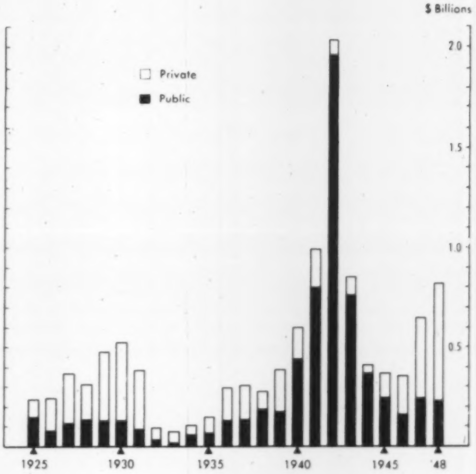
EARTHWORK



STREETS & ROADS



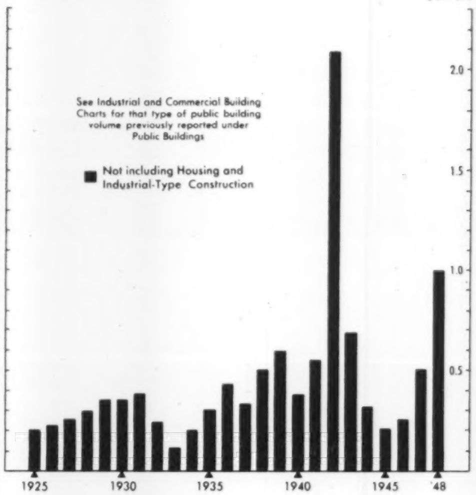
UNCLASSIFIED CONSTRUCTION



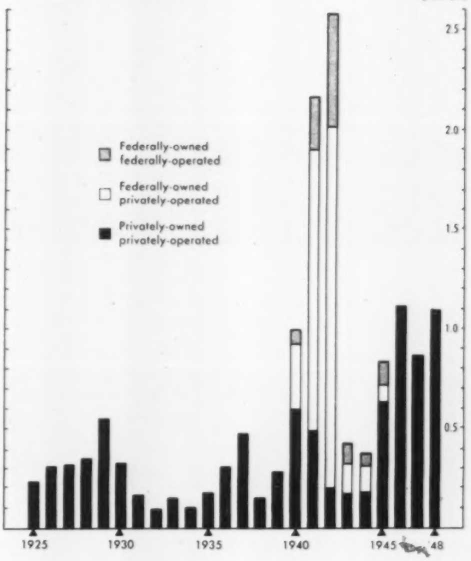
UNCLASSIFIED CONSTRUCTION—PRIVATE & PUBLIC

Private	1946	1947	1948
Transportation Lines	$75,128,000	$53,853,000	$119,182,000
Pipe Lines	43,314,000	236,892,000	363,338,000
Railroads	20,356,000	57,053,000	30,155,000
Telephone	10,578,000	9,510,000	2,693,000
Shipyards	75,000	......	......
Radio	......	6,969,000	4,274,000
Airports	12,806,000	319,000	1,320,000
Other	33,898,000	41,965,000	67,278,000
Total Private	196,155,000	406,561,000	588,240,000
Public—Federal			
Airports, Airbases	9,910,000	36,366,000	5,069,000
Hangars, Buildings	5,013,000	11,872,000	7,125,000
Airport Housing	8,506,000	14,974,000	486,000
Airport Facil. & Util	1,687,000	10,219,000	5,147,000
Shipyards	33,690,000	1,617,000	948,000
Other	25,997,000	29,100,000	51,022,000
Total Federal	84,803,000	104,148,000	69,797,000
Public—State & Municipal			
Airports	24,585,000	47,762,000	75,579,000
Subways, Tunnels	23,733,000	28,210,000	17,621,000
Other	24,836,000	65,702,000	68,470,000
Total State & Mun.	73,154,000	141,674,000	161,670,000
Total Unclassified	**$354,112,000**	**$652,383,000**	**$819,707,000**

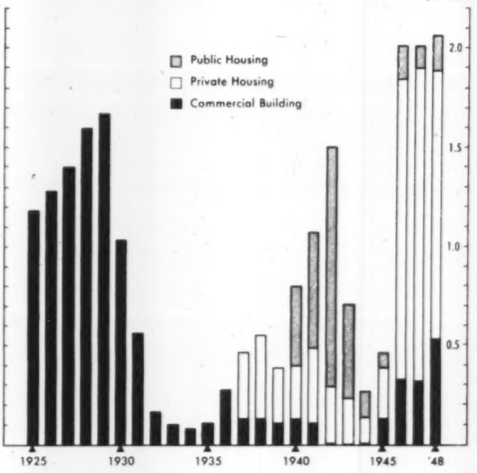
PUBLIC BUILDINGS



INDUSTRIAL BUILDINGS



COMMERCIAL BUILDINGS

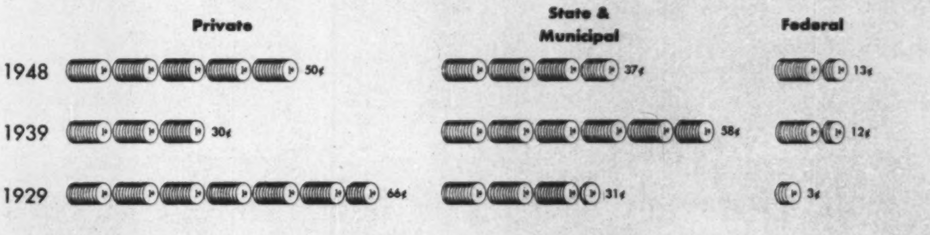


PLANT EXPANSION BY INDUSTRIES

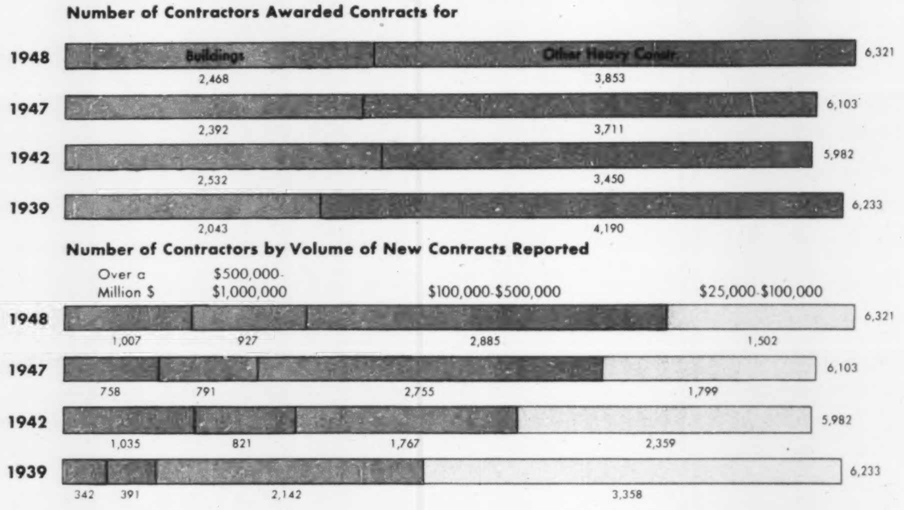
	1946	1947	1948
Transportation Service			
1. Railroads	$17,198,000	$12,402,000	$9,314,000
2. Automotive	33,544,000	26,392,000	47,989,000
Public Utilities	**93,330,000**	**125,307,000**	**249,820,000**
Process Industries (a)	**499,302,000(c)**	**292,544,000(c)**	**401,144,000(c)**
Food Industries (b)	**118,997,000**	**123,152,000**	**75,122,000**
Metal Refining & Rolling	**39,833,000**	**46,215,000**	**61,139,000**
Metal Working Plants			
1. Auto Factories	29,390,000	11,526,000	8,016,000
2. Aircraft Factories	1,698,000	2,297,000	1,525,000
3. Foundries	5,693,000	2,838,000	5,209,000
4. Mach. & Mach. Parts	114,671,000	101,173,000	113,663,000
Radio	**1,045,000**	**1,660,000**	**1,845,000**
Textiles (Excl. rayon)	16,325,000	11,624,000	9,846,000
Wood Industries	**10,391,000**	**8,121,000**	**8,116,000**
Miscellaneous			
1. General Factories	122,647,000	92,317,000	101,102,000
2. Refrigeration & Cold Storage	9,187,000	4,637,000	1,704,000
Total	**$1,113,251,000**(c)	**$862,205,000**(c)	**$1,095,581,000**(c)

(a) Includes distilleries. (b) Includes breweries and wineries. (c) In addition to these figures, contracts totaling $25,000,000 were awarded for federally-owned plants in 1946, $15,899,000 in 1947, $824,000 in 1948.

SOURCE OF EACH YEAR'S ENGINEERING CONSTRUCTION DOLLAR



CONTRACTORS FOR ENGINEERING CONSTRUCTION



Number of Contractors Awarded Contracts for

Number of Contractors by Volume of New Contracts Reported

As reported by Engineering News-Record

EQUIPMENT SHIPMENTS, Excavating & Earthmoving

	Millions of $			Aver. per Quarter		
	1946	1947	1948*	1948*	1947	% Gain
Total	282.6	437.2	383.9	127.9	109.3	+ 16.8
Power Shovels & Cranes	81.4	132.8	117.4	39.1	33.2	+ 17.7
Road Constr. & Maint.	88.6	99.3	88.9	29.6	24.8	+ 19.4
Dozers	20.1	20.5	18.9	6.3	5.1	+23.6
Other Tractor Mounted Equip.	y	20.3	14.8	4.9	5.1	− 4.0
Tractor Crawler	81.3	134.4	117.6	39.2	33.6	+ 16.8
Tractor, Wheel	y	18.5	17.0	5.7	4.6	+24.1
Drills, Well & Blast Hole	11.2	11.4	9.3	3.1	2.8	+ 10.5
Mixers, Pavers, Other Concrete Equip.	32.6x	y	y			
Other Miscellaneous	13.8x	y	y			

* First 3 quarters

y not reported

x not included in '46 total

Source: Facts for Industry, Bu. of Census

State Highway Programs Top $1.5 Billions for 1949

Construction and maintenance budgets running 1 percent below 1948 expenditures

Twenty state highway departments plan to increase their new construction and maintenance in 1949. Twenty-six states and the District of Columbia are budgeting less construction and maintenance this year. Two states, West Virginia and Illinois have not set their 1949 objectives.

Construction and maintenance totaled $1.582 billion in 1948. This was 5 percent more than the estimated budgets reported in ENGINEERING NEWS-RECORD February 19, 1948, p. 129 which forecast $1.5 billion.

Based on preliminary 1949 estimates reported to ENGINEERING NEWS-RECORD by state highway officials, total highway and bridge expenditure by the states should top $1.5 billions, just 1 percent under their 1948 record. Action by legislatures meeting in Iowa, Arkansas and West Virginia may close this small gap. Maintenance should run about 1.5 percent higher than in 1948, work handled by state forces, 1 percent more, and maintenance by contract, 6 percent higher. New construction programs average 3 percent below last year. Purchases of new equipment are expected to drop 14 percent. This means that 1949 expenditures for new construction should top $1.1 billions, for maintenance $400 millions, for new equipment, $44 millions.

Total mileage built in 1948 was 40,798, of which 26 percent was hard surface, a 176 percent rise over 1948. All other types and total mileage were lower than in 1947.

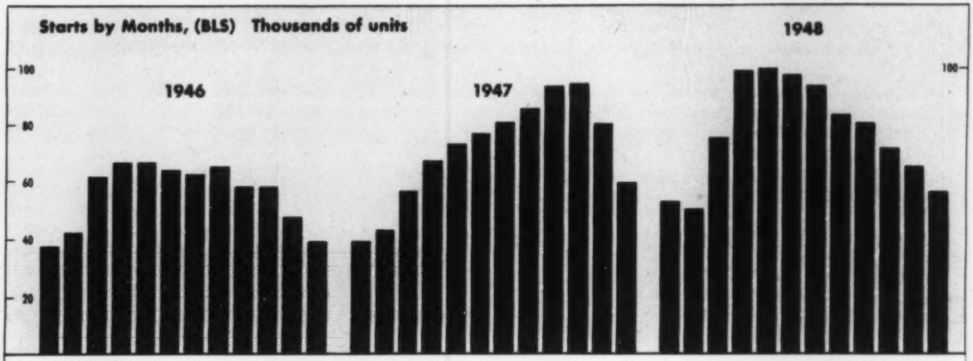
STATE HIGHWAY PROGRAMS—1948-1949

Reported to Engineering News-Record by State Highway Executives

	Mileage Built, 1948					Bridges, grade crossing elimination struc.	Expenditures, 1948—Budget for 1949—Thousands of Dollars (,000 omitted)										
							New Contract Awarded		Maintenance By State		Maintenance By Contract		New Equipment		Total Construction and Maintenance		% Change in
States	Hard surface, incl. bit., conc., asph.	Other bituminous	Gravel or stone surfaced	Graded and drained	Total		1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1949
Me	55	232	....	....	287	57	$10,458	$7,162	$5,338	$5,500			$188	$100	$15 796	$12 662	− 20
N. H.	31	57	6	....	94	14	5,000	4,000	4,500	4,100			100	350	9 500	8 100	− 15
Vt	17	170	....	....	187	37	2,576	2,750	3,846	2,850			168	75	6 422	5 600	− 13
Mass. f	65	....	....	....	65	24	9,663	21,058[1]	8,338	4,051[1]	747	502[1]	500	320[1]	18 748	25 611[1]	+ 37
R. I.	36	....	....	....	36	2	5,000	6,000	2,000	2,000			160	100	7 000	8 000	+ 14
Conn	41	13	35	10	99	32	16,330	22,500	6,800	7,500			1,300	950	23 130	30 000	+ 30
New England	**245**	**472**	**41**	**10**	**768**	**166**	**49,027**	**63,470**	**30 822**	**26 001**	**747**	**502**	**2 416**	**1 895**	**80 596**	**89 973**[1]	+ 12
N. Y.	142	327	2	10	536	55	90,097	140,000	20,961	22,000	4,000 est.	4,000	1,000	1,000	115 058	166 000	+ 44
N. J. f	57[2]	8	5	12[2]	85[9]	38	40,204	31,512	7,030	7,200	164	180	581	600	47 398	38 892	− 18
Pa	578	755	428	23	1,795[9]	500	117,912	27,000	27,830	29,500	0	0	3,532	4,000	145 742	56 500[10]	− 61
Md	52	26	13	....	265[8,9]	18	30,274	55,000	4,190	4,938	594	500	659	954	35 058	60 438	+ 72
D. C.	27	8	1	3	39	3	4,170	3,570	1,023	920	314	440	100	100	5 507	4 930	− 10
Del.	60	14	....	....	74	3	4,800	4,500	1,400	1,650	502	500	110	90	6 702	6 650	− 8
Mid. Atlantic	**916**	**1138**	**449**	**48**	**2,794**[8,9]	**617**	**287,457**	**261,582**	**62 434**	**66 208**	**5 574**	**5 620**	**5 982**	**6 744**	**355 465**	**333 410**	− 6
Va	56	380	5	15	456	65	7,000	24,000	14,500	14,500	2,250	2,500	500	750	23 750	41 000	+ 73
W. Va	170	813	374	164	1,521	72	24,189	[3]	20,229	[3]	0	[3]	2,975	[3]	44 418	......	
N. C.	531	555	24	77	1,219[9]	87	42,093	50,000	19,600	22,000	0	0	2,602	2,500	61 693	72 000	+ 17
S. C.	6	1,204	....	11	1,221	41	21,394	20,000	5,808	6,000	1,700	1,500	1,000	800	28,894	27,500	− 5
Ga	150	1,255	2	216	1,649[9]	113	43,883	16,000	5,608	3,200	1,953	1,100	1,222	700	51,444	20,300	− 61
Fla	127	318	....	50	495	52	18,549	20,572	8,353	5,537	....	....	1,286	None	26,902	26,109	− 29
Ala	900	....	....	860	1,700	110	9,869	6,000	3,128	5,000	....	....	1,023	1,023	12,997	11,000	− 15
Miss	39	245	63	74	421	58	9,225	9,000	3,700	3,900	0	0	518	500	12,925	12,900	
La	92	356	143	15	606	30	23,678	25,000	10,450	11,066	2,377	2,330	720	1,500	36,505	38,396	+ 5
Ky	207	621	62	13	903	30	15,612	25,000	8,964	9,000	442	500	1,380	1,500	25,018	34,500	+ 38
Tenn	283	387	189	219	1,078	....	31,000	39,000	2,000	3,000	Incl. in new constr.		1,000	1,250	33,000	42,000	+ 27
South	**2,561**	**6,134**	**862**	**1,654**	**11,269**[9]	....	**246,402**	......	**102,332**	......	....	....	**14,226**	....	**357,546**	....	....
Comparable States (1 missing)						**658**(1)	**222,303**(1)	**234,572**	**82,103**(1)	**83,203**	**8,722**	**7,930**	**11,251**(1)	**10,523**	**313,128**(1)	**325,705**	+ 4
Ohio	688	197	132	0	1,017	144	58,884	60,000	19,500	20,500	5,300	6,500	3,500	2,500	83,684	87,000	+ 4
Ind	504	17	25	4	550	49	25,800	20,000	6,880	6,880	325	350	817	900	33,005	27,230	− 17
Ill	284	332	149	72	837	36	40,594	......	13,525	....	234	....	1,910	....	54,353	....	....
Wis	206	1,999	277	49	2,531	124	31,963	30,000	8,095[4]	11,000[4]	860	3,000	County Purchases		40,918	44,000	+ 8
Mich	193	307	71	32	603	53	30,588	30,000	2,681	2,625	8,639	8,473	489	524	41,908	41,098	− 2
Mid. West	**1,875**	**2,852**	**654**	**157**	**5,538**	**406**	**187,829**	......	**50,681**	......	**15,358**	......	**6,716**	....	**253,868**	....	....
Comparable States (1 Missing)							**147,235**(1)	**140,000**	**37,156**(1)	**41,005**	**15,124**(1)	**18,323**	**4,806**(1)	**3,924**	**199,515**(1)	**199,328**	....
Minn	193	87	25	335	640	35	20,300	18,000	12,338	[5, 12]	2,250	[5, 12]	1,150	750	34,888	....	....
Iowa	123	47	144	189	503	71	12,616	3,842[6]	4,889	5,630	1,102	1,200	1,125	700	18,607	10,672	− 43
Mo	149	650	530	36	1,371[9]	141	25,328	33,000	10,500	10,500	....	....	1,427	750	35,828	43,500	+ 21
Ark	1	330	35	0	366	7	1,800	11,000[7]	6,900	8,500	0	0	613	750	8,700	19,500	+124
N. D.	234	....	450	223	907	12	7,388	7,500	2,980	3,203	1,200	800	824	600	11,568	11,500	− 1
S. D.	8	260	227	216	711	29	8,229	8,000	4,500	4,500	....	....	527	400	12,729	12,500	− 2
Neb.	30	270	268	264	832	82	13,724	7,500[11]	5,160	5,250[11]	740	750	450	500	19,624	13,500	− 31
Kan.	89	543	1,401	507	2,540	77	20,036	20,000	6,286	6,391	1,705	1,985	1,071	600	28,027	28,376	+ 1
Okla	119	781	636	966	2,502	99	18,881	22,500	728	750	3,761	4,500	750	900	23,370	27,750	+ 19
Tex	2,753	1,095	46	339	4,239[9]	326	73,407	50,000	19,672	15,000	0	0	3,556	1,800	93,079	65,000	− 30
Mont	280	not seg.	232	33	545	69	13,164	13,085	5,158	4,600	301	500	805	300	18,623	18,185	− 2
Wyo	17	183	136	163	500	....	9,500	8,500	2,200	2,500	0	0	750	700	11,700	11,000	− 6
Colo	1	1,281	167	33	1,482	78	18,000	18,000	4,220	4,050	....	....	747	500	22,220	22,050	− 1
N. M.	105	195	35	....	335	7	9,888	12,500	2,337	2,500	393	2,500	684	500	12,618	17,500	+ 39
W. of Miss.	**4,102**	**5,722**	**4,332**	**3,304**	**17,473**[9]	....	**252,261**	**233,427**	**87,868**	......	**11,452**	......	**14,479**	**9,750**	**351,581**	....	....
Comparable States (1 Missing)					**16,653**[9]	**1,033**(1)	**252,261**	**233,427**	**75,530**(1)	**73,371**	**9,202**(1)	**12,235**	**14,479**	**9,750**	**336,993**(1)	**301,033**	− 11
Idaho	....	220	62	....	282	5	5,403	12,455	2,900	3,000	....	....	178	210	8,303	15,455	+ 86
Utah	....	135	42	6	183	17	4,700	5,000	2,800	3,000	105	....	220	350	7,605	8,000	+ 5
Ariz	0	216	16	54	286	55	10,713	10,000	1,800	1,750	....	....	442	400	12,513	11,750	− 6
Nev	0	208	37	0	245	12	4,688	7,862	1,211	1,467	0	0	285	250	5,799	9,329	+ 61
Wash	60	339	115	101	615	36	25,500	17,000	6,015	6,500	153	700	493	650	31,678	24,200	− 24
Ore	104	164	124	119	511	34	5,543	6,320	8,013	9,260	820	500	1,110	1,150	14,376	16,080	− 12
Calif	485	210	....	139	834	135	80,266	75,429	20,290	19,000	2,566	....	4,150	3,500	103,122	94,429	− 8
Far West	**649**	**1,492**	**396**	**419**	**2,956**	**294**	**136,713**	**134,066**	**43,039**	**43,977**	**3,644**	**1,200**	**6,878**	**6,510**	**183,396**	......	....
Comparable States (# Missing)							**136,713**	**134,066**	**43,039**	**43,977**	....	....	**6,878**	**6,510**	**180,725**	**179,243**	− 1
U. S.	**10,348**	**17,810**	**6,734**	**5,596**	**40,798**[8,9]	....	**1,159,779**	......	**377,176**	......	**45,497**	......	**59,697**	....	**1,582,452**	......	....
Comparable States (# Missing)			....	....	....	**3,174**(2)	**1,094,996**(3)	**1,067,117**(3)	**331,084**(3)	**333,765**	**43,013**(2)	**45,810**[1]	**45,812**(2)	**39,346**[1]	**1,446,422**	**1,428,632**[1]	− 1
Percent Change from Previous Year								−3		+1		+6		−14		−1%	

f—Fiscal year. [1] MASS. for 1949. To June 30 only. Proj. authorized after July 1 not incl. [2] N. J. Hard surface incl. 25 mi. dual. Graded and drained incl. 1 mi. dual, 2.7 mi. multiple lane. [3] W. VA. State Legislature now in session cannot estimate full program. $50 million bond issue for secondary roads approved by electorate last Nov., but enabling act not yet passed by Legislature. [4] WIS. By county forces. [5] MINN. Legislature meeting. [6] IOWA. Based on present statutes. Legislature now in session and bill will be introduced to provide additional 6 to 7 million dollars which with Federal Aid would approx. $13 million. [7] ARK. Based on estimated present income; proposed legislation includes measures to increase annual income and submit to voters proposal to borrow $7 million annually for 4 years. [8] MD. 170 mi. Widening and resurfacing existing highways. [9] Includes soil surfaced: N. J. 3 mi., PA. 11 mi., MD. 4 mi., N. CAR. 32 mi., GA. 26 mi., Mo. 6 mi., TEX. 6 mi., Total 88 mi. [10] PA. Carryover from 1948 contracts $75 million. [11] NEBR. Blizzard conditions require revision to new contracts $4 million, maintenance $7 million, Total $11 million. [12] MINN. Later report, state maintenance $10.1 million '48, $9.5 million '49.

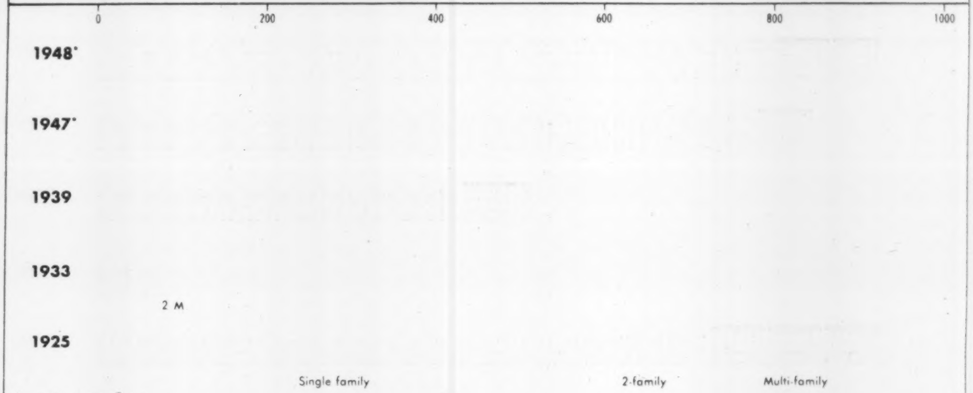
HOUSING CONSTRUCTION, FINANCING, COSTS



Starts by Months, (BLS) Thousands of units

Source: Bu. of Labor Statistics

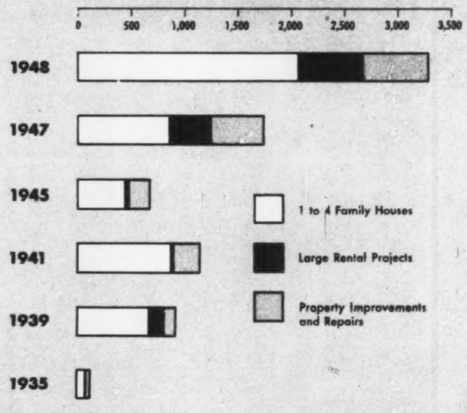
Types of Dwelling Units Provided (BLS) Thousands



Source: Bu. of Labor Statistics

*Note: Permanent housing units reported by the Bureau of Labor Statistics, 1940 through 1948, total 5,127,700. President Truman's economic advisers estimate an additional 4,000,000 dwellings were made available in 1940-48, through the reconditioning of sub-standard units and non-residential property.

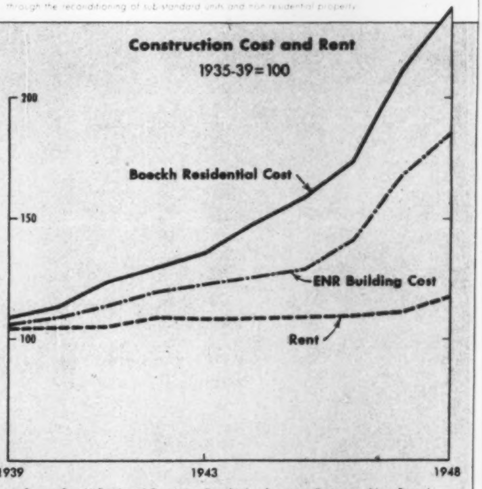
FHA Insurance, Millions of $



Source: Federal Housing Administration

Construction Cost and Rent

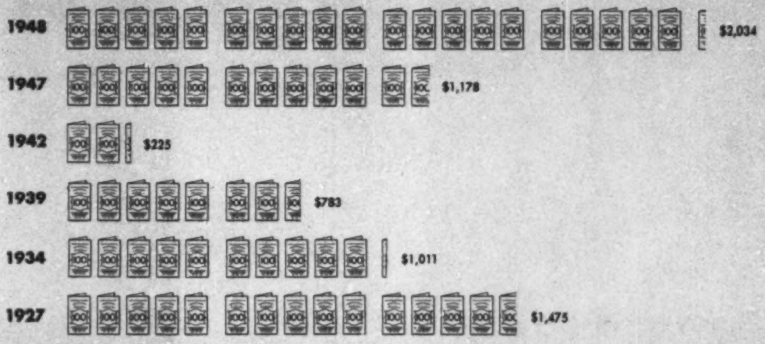
1935-39=100



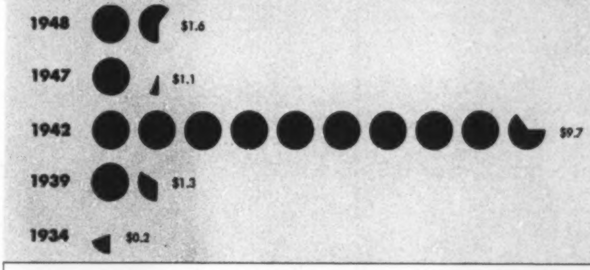
Source: Boeckh Residential Cost Index; Bu. of Labor Statistics, Engineering News-Record

FINANCING PUBLIC CONSTRUCTION

By State and Municipal Bond Sales, Millions of $

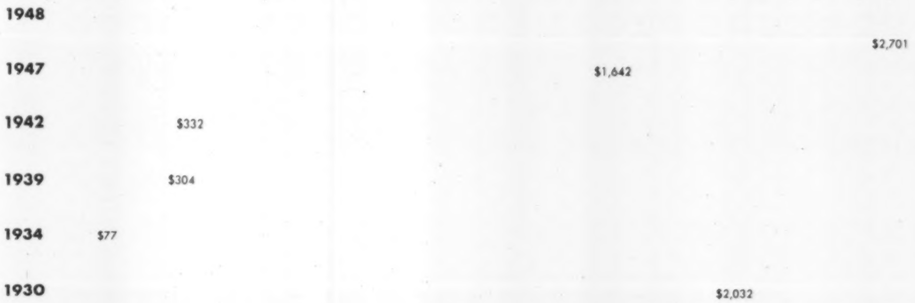


By Federal Appropriation, Billions of $

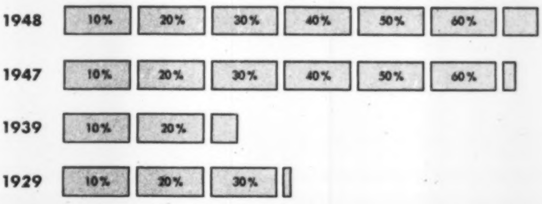


FINANCING PRIVATE CONSTRUCTION

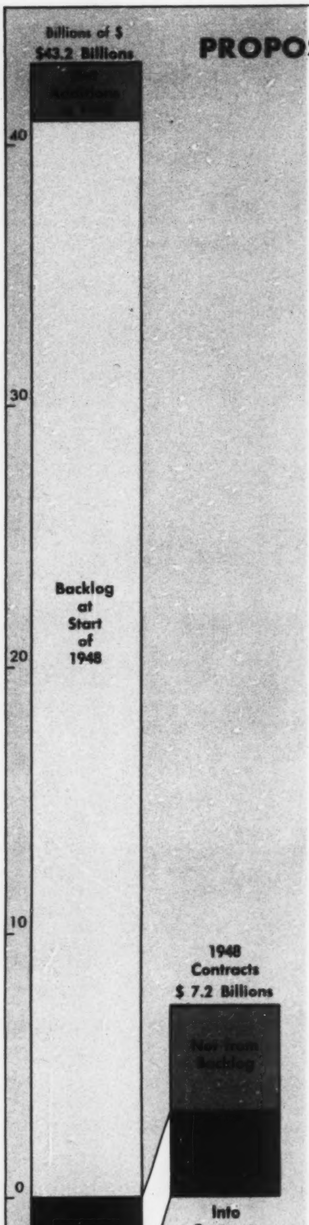
By Corporate Security Sales, Millions of $



By Profits Plowed Back—Percent of Total (Bldg. & Equip.)

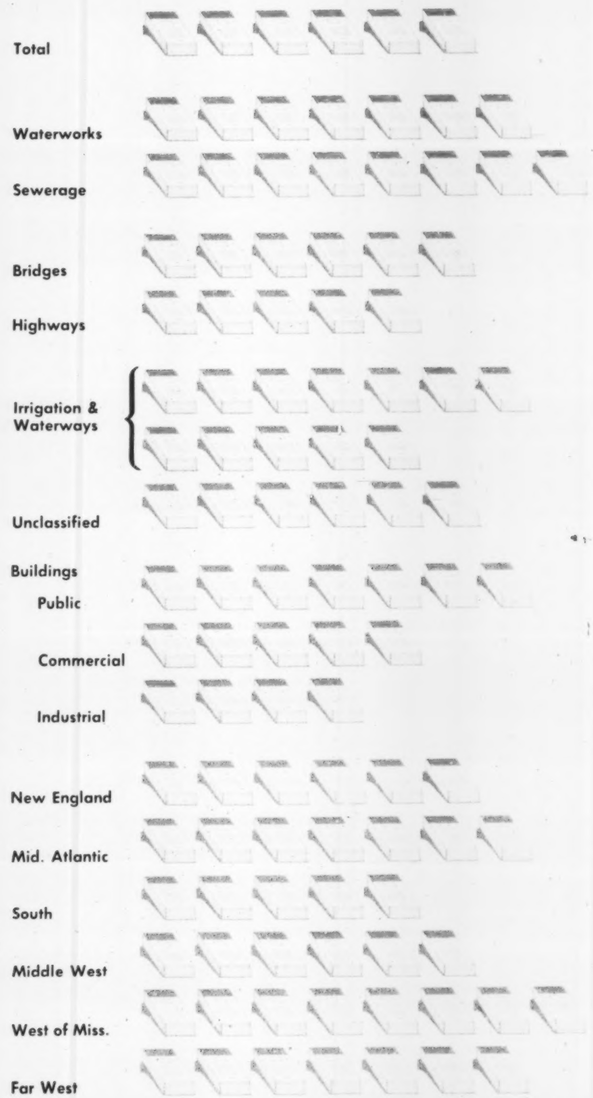


PROPOSED CONSTRUCTION BACKLOG



Source: Business News Department, Engineering News-Record

MEASURED IN YEARS OF CONSTRUCTION AT 1948 RATE



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THREE-MILE CREEK SEWAGE PLANT at Mobile, Ala.—one of two disposal projects—will provide chlorination, primary clarification, heated sludge digestion, and sludge-drying beds.

SUMMARY OF MAJOR PROJECTS

Reviews of projects currently in the news with information on costs, size and features

SEWAGE DISPOSAL

SAN FRANCISCO, CALIF. – Bids called early in 1948 on units of the North Point sewage-treatment plant were rejected. Later, new bids were called and an $8,289,000 contract was awarded for the sedimentation plant. Work will start in Jan. 1949. The sludge-treatment plant is scheduled for bids later this year. It will be followed at a later date by bids on influent and effluent channels and twin 10-in. sludge force lines, 6 miles long.

OAKLAND, CALIF., VICINITY – The $24,000,000 program to provide interception and treatment of sewage from a population of more than 750,000 in Alameda County is well under way with 8 of 21 miles of interceptors under contract. Administered by Special District No. 1 of the East Bay Municipal Utility District, the program in 1949 will include bid calls for construction of the treatment plant and a 3-mile outfall as well as more interceptors. Sand fill for the treatment plant, amounting to 310,000 cu. yd., and 3,750 sand drains have been placed.

PORTLAND, ORE.—Three major interceptor units are complete or nearing completion on Portland's $14,000,000 interceptor and disposal project. Bids on the treatment plant will be called early this year. With the site graded and equipment ordered, the project is expected to be complete within 3 years.

LAKE CITY, WASH.—Voter approval of bonds totaling $7,500,000 has launched what has been termed "the nation's largest suburban sewer project" in the Lake City Sewer District just north of Seattle, Wash. First contracts will be let in March, 1949. Project includes a 7 mgd. activated sludge plant estimated at $1,500,000, more than 200 mi. of lateral, interceptor and trunk sewer lines varying up to 48-in. in dia., and 11 pumping stations.

LOS ANGELES, CALIF.—Contracts under way on the $41,000,000 sewage disposal project at Hyperion showed the following percentage of completion as of Jan. 1, 1949 (figures in parentheses are contract amounts): Headworks ($1,389,100) 91 percent; 12-ft. dia. outfall extending 5,000 ft. offshore ($3,517,800) 99 percent; preparation of site, including moving 14,200,000 cu. yd. of sand ($3,494,300) 99 percent; effluent outfall connection ($195,400) 87 percent; primary-settling system ($3,613,900) 25 percent; digestion system ($3,991,100) 49 percent; filter, drier and fertilizer storage system ($6,300,100) seven percent; power and blower plant ($3,583,600) four percent; general piping ($1,049,600) zero percent. The outfall will be put in service about April 1 and the other units will go in service when all portions of the 245-mgd. activated-sludge plant are completed. Contracts to be let in 1949 are: Power and light distribution, filter and drier stack, aeration system, final settling system, elutriation and sludge concentration, warehouse and shops, administration and laboratory, influent connection and landscaping.

HONOLULU, T. H.—Some $3,500,000 of a $22,000,000 5-year program is already complete or under contract. This includes a pumping plant, a 6,000 ft. tunnel and pressure and gravity sewers. The 1949 program to cost another $3,500,000 will include a 79-in. outfall extending 3,600-ft. offshore.

STOCKTON, CALIF.—Work will be completed early this year on a $1,330,000 contract for the primary-treatment facilities of a 20-mgd., high-rate trick-

IN LOS ANGELES, primary-settling basins are under construction for the 245-mgd. sewage-treatment plant at Hyperion.

AT COLUMBUS, OHIO, part of the $2,162,000 expansion program of the disposal works is the $505,000 grit-separation chamber which includes mechanical screens, grit separation with air diffusion and clam-bucket-on-bridge-crane sediment removal.

ling-filter plant. Part of the secondary-treatment installation may be built this year if money is available.

BOISE, IDAHO—Construction of the first major sewage disposal plant in Idaho—an activated sludge plant—was started in July 1948, with completion scheduled for next September. Included in the $1,375,000 project is a 27- to 48-in. intercepter sewer and a 12-mgd. disposal plant. Effluent will be chlorinated and dumped into the Boise River, which is used for irrigation of root crops.

WASHINGTON, D. C.—Enlargement of the District of Columbia sewage treatment plant is to be carried out under a $1,267,000 contract that is expected to be let in the near future. The project, which is scheduled to run more than 20 months, will add four sedimentation tanks and four sludge-digestion tanks, increasing the total numbers of units to sixteen and twelve, respectively. The design of the new facilities will closely follow that of the existing tanks.

CHICAGO, ILL. — A $58,160,000 bond issue to finance the first part of a major sewer construction program, estimated to cost $120,000,000, has been approved. In 1948, the Bureau of Sewers completed contracts totaling $2,300,000 on two systems serving 1,000 acres on the north side and 5,800 acres in the southwest portion of the city. An award has been authorized on a $970,000 low bid for extension of the latter system. Work is nearing completion on a $3,050,000 section of a line that will ultimately have a drainage area of 7,000 acres in the west central district, and bids will be asked this year for a second section. Tunneling on a $1,525,000 stretch of south-side sewer, awarded in 1948, has been completed and open-cut will begin this spring. Construction expenditures for 1949 will be $8,000,000, including work on the first section (twin 12 x 12-ft. concrete barrels) of the $11,000,000 Roscoe St. System to drain 3,500 acres in the northwest section. A low bid of $1,580,000 has been received on a section of the Central South Side system—part of the comprehensive sewer plan being built jointly by the city and the Sanitary District of Chicago.

CHICAGO SANITARY DISTRICT—The construction program includes $33,500,000 for sewage treatment works and $59,600,000 for sewers. About 45 percent in each category has been completed. Contracts totaling more than $8,500,000 are now underway for treatment works and $5,800,000 will be awarded this year. At the West-Southwest works, facilities are being added to provide activated sludge treatment for the 400 mgd. effluent of the West Side Imhoff tanks. With these in service, all sewage in the District (1,050 mgd.) will receive complete treatment. Sludge disposal facilities also are being expanded to heat-dry the sludge, which will be 500 tons per day, dry basis. On sewer construction contracts of $24,300,000 are outstanding, with additional awards of $8,300,000 scheduled for 1949. Principal items are 13½ mi. of 16½-to 20-ft. tunnel sewer on the South Side; 2 mi. of 5½-ft. tunnel outfall from Evergreen Park; and 8 mi. of 2-to- 9-ft. sewers in tunnel to serve the north-shore suburbs. The first two projects are expected to be completed late this year.

CANTON, OHIO—Bids will be taken this spring for a $3,600,000 intercepting sewer and 20-mgd. activated-sludge plant with facilities for grinding all city garbage. The sewage-garbage sludge will be digested in externally heated tanks and disposed of by spreading over a city-owned farm. A sewer-rental ordinance for the project is in effect and collections at a reduced rate are now being made, although bonds have not been sold.

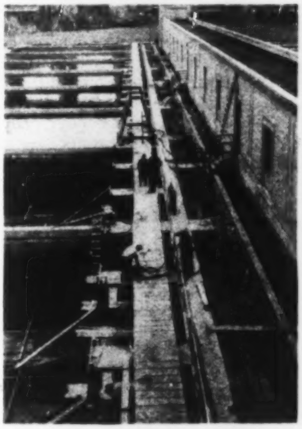
COLUMBUS, OHIO — Enlargement and improvement of the sewage-treatment plant is well underway. A $505,000 housed-in grit collector with mechanically cleaned screens, air-diffusion equipment and overhead buckets is 90 percent complete. Replacement of diffuser plates in the aeration tanks with swing-type diffusers has been completed under a $303,000 contract. Under a $178,000 contract, primary-settling tanks are being improved by addition of overflow weirs, removal of concrete covers, installation of new sludge-discharge piping, and conversion or the original grit channels to pre-aeration chambers. Bids will be taken this year on a 1000-kw., dual-fuel-engine generator expected to cost $126,000; a $250,000 addition to the generator station to house this unit; and eight sludge digestors that will increase unit capacity from 1.7 to 3.0 cu ft. per capita for 400,000 population. Estimated cost of the digestors is about $800,000.

MADISON, WISCONSIN — A $2,210,000 expansion of the Madison Metropolitan Sewerage District's collection facilities is underway. Included are: Three pumping stations, interceptors, and force mains to the Nine Springs treatment plant. A $750,000 third addition to this plant—a combination Imhoff and trickling-filter plus activated-sludge plant—also is under construction to increase capacity from 13 to 20 mgd. Preliminary settling facilities are being increased 50 percent, aeration tanks by 60 percent and final settling tanks by 45 percent. Completion of both projects is scheduled for April 1950.

HOUSTON, TEXAS — Sludge from two sewage treatment plants, now lagooned, will be made into fertilizer in a $1,250,000 drying plant, scheduled to get underway this year. Vacuum filters will produce 70 tons of dewatered sludge per day.

MOBILE, ALA.–A $2,200,000 sewerage and sewage disposal program is being carried out. Work includes: The 2.8-mgd., primary-treatment Three-Mile Creek disposal plant; the 1.4-mgd. primary and secondary treatment Eslava Creek plant; and trunkline as well as new street sewers.

AT PORTLAND, ORE., interceptor and main sewers with a 120-in. semi-elliptical section are a major portion of the $14,000,000 sanitation program.



WARD'S ISLAND DISPOSAL PLANT —Improvements at New York City's plant include influent channel to change inlets from the center to one end of final settling tanks.

ST. LOUIS, MO. — To implement the recently-established refuse-disposal program, two $1,000,000 incinerators will be built this year. With a capacity of 400 tons per day, each plant will have four furnaces in a 211 × 111-ft. building, and twin chimneys 175 ft. high. A 17,000-cfm. blower for each furnace will furnish excess combustion air to reduce furnace and stack temperatures. Detailed plans, which will enable general contractors to bid on the work, are complete.

PITTSBURGH, PA.–Initiation of the Allegheny County Sanitary Authority program for collection and treatment of sewage in the metropolitan area depends upon execution of long-term agreements with 83 municipalities that have indicated their intention to take authority services, and 13 other units that are expected to participate. The contracts provide for: (1) Payment of partial sewerage-service charges beginning in Jan. 1950; (2) Partial charges to be one-third of the calculated final charge when plant is in operation, to defray engineering, administrative and interest costs during construction; (3) Sewerage systems of the participating municipalities to be turned over to the authority as a basis for initiation of partial charges; and (4) The authority to bill and collect all charges but require municipalities to guarantee all accounts. At the end of the year only the Borough of Braddock had empowered its officials to execute the required contracts but other municipalities are expected to follow.

PORTSMOUTH, VA. — The first sewage disposal plant, at Pinners Point, will go into operation this spring as part of the general cleanup of Hampton Roads. The 10.7-mgd., $920,000 primary-treatment plant includes separate sludge digestion, chlorine contact and elutriation, and vacuum filtration. All operating power is generated by sludge-gas engines.

TAMPA, FLA.—Bids will be taken next month on the first sections of a $10,000,000 sewerage and disposal program. A large part of the work will be sewers, pumping stations, interceptors up to 60 in., and a 78-in. concrete outfall discharging 3,000 ft. out in Tampa Bay. A 35-mgd. partial treatment plant —the city's first—is also included.

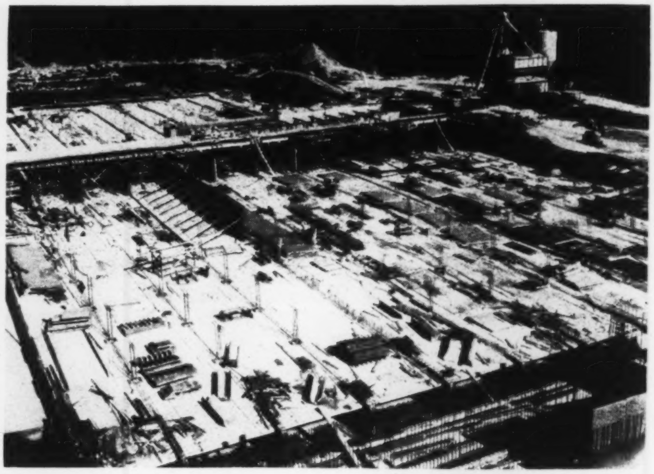
BOSTON, MASS.–Construction contracts for foundations, aeration and sedimentation tanks, influent and effluent conduits, grit channels, main-building substructure, digestion tanks, and sludge-disposal line for the $6,500,000, 300 mgd. Nut Island sewage-treatment plant were let last year. Expected to be let this year are contracts for main-building superstructure, administration, chlorinating, utility, gas buildings and digestion control buildings and pump houses, gas-storage sphere, and experimental fertilizer plant. Completion of the project is planned for 1950. The 80-mgd., $2,000,000 Alewife Brook Conduit for storm water is about ten percent complete. Some work is in progress on borings, designs and investigations for the $11,000,000 North Metropolitan

Relief Tunnel that will convey sewage to the proposed $6,000,000 Deer Island treatment plant.

WINCHESTER, VA.—A $1,024,000 sewer and sewage-treatment program is about 40 percent complete. The work consists of 29,000 ft. of sewers and a 2.4-mgd. bio-filtration treatment plant. The plant includes coarse screens; grit chamber; communitors; grease-removal tanks; three, 125,000-gal. primary clarifiers; primary and secondary 125-ft. dia. high-rate filters; two, 225,000-gal. final clarifiers; two, 250,000-gal. digestors; eight sludge-drying beds and a control building.

BUFFALO, N. Y. — The "Quarry Project" consisting of a 17.5-mgd. storm-water retention basin, a 6,700-gpm. pumping station, a 42-in. outlet sewer and a 7-ft. horseshoe inlet trunk sewer is about 25 percent complete. With $645,000 in two contracts to be let, total project cost is about $2,000,000. Completion is scheduled for Sept. 1949.

NEW YORK CITY—Construction of long-needed sewage treatment plants will be financed as city-wide assessable improvements. The construction schedule calls for six major plants in the next five years and completion of the entire program in ten years. With $4,860,000 in active contracts, work has been resumed on Brooklyn's $9,240,000 26th Ward plant. The 60-mgd. activated-sludge plant will serve about 350,000 persons in the Jamaica Bay area. Preliminary authorization has been obtained for construction of the $22,000,000 Owls Head treatment works on Upper New York Bay. This 160-mgd. plant utilizing the newly developed high-rate, activated-sludge process will serve more than 1,000,000 persons. The first contract for bulkhead, landfill and outfall is 90 percent complete. Low bids received for additional work are: Pump and power house — $3,748,240, and electrical equipment—$748,865. Contracts for rehabilitation and improvement of the Coney Island and Wards Island sewage treatment plants, totaling $570,000 were let in 1948. The $1,134,000 East Bronx intercepting sewer, which will discharge to the Wards Island plant, is about 40 percent complete. This project consists of 5,890 ft. of 42 to 48-in. pipe. Work on the $1,874,000 Whitestone interceptor-collector in the Borough of Queens has recently been authorized. This sewer, which will drain a 3,200-acre area tributary to the upper East River, is 17,000 ft. long and varies from 54 to 60 in.



TO PROVIDE MORE WATER—Capacity of the Metropolitan Water District of Southern California will be double this summer with completion of the $4,000,000 water-softening and filtration plant near La Verne, Calif.

MUNICIPAL WATER SUPPLY

MOKELUMNE AQUEDUCT—The $22,000,000, 81-mile supplementary line will be completed and in service by April 1. Under gravity flow, it will increase capacity of the East Bay Municipal Utility District by 50 mgd. The existing line with booster plants furnishes 98 mgd. The water demand of the district—including Oakland, Calif., and other nearby cities—has averaged 106 mgd. recently and this has been met by use of completed sections of the new line. Ultimate capacity of the two lines will be 214 mgd. after future addition of two pumping plants on the new line.

SOUTHERN CALIFORNIA—At the end of 1948 work on doubling the capacity of the Metropolitan Water District's 100-mgd. LaVerne softening and filtration plant was about 70 percent complete. Work on the $2,592,400 construction contract is expected to be completed this spring, ahead of schedule, so that the extra capacity will be available to meet summer water demands.

HETCH HETCHY AQUEDUCT—More water for San Francisco is coming via a second line across the San Joaquin Valley and a line around the south end of San Francisco Bay, bypassing two lines across the bay. Some 33 miles of 62-in. concrete pipe will be laid by September on the San Joaquin line at a cost of $8,000,000. Bids will be called in March on the 35-mile, 72-in. line around the bay. Cost of this section is expected to reach $12,000,000.

PHOENIX, ARIZ.—A $6,000,000 expansion program is rapidly nearing completion with the 30-mgd. filter plant scheduled for early operation. Major uncompleted work includes the $800,000 spillway gates on Horseshoe Dam and a booster station. Under a new bond authorization more than 6 miles of 60- and 54-in. lines will be built.

SAN DIEGO, CALIF.—Voter approval of a $4,500,000 bond issue will permit award in 1949 of a construction contract for the 66-mgd., Alvarado Treatment Plant for which $1,750,000 is budgeted. Equipment has been ordered and the plant site graded. Pipeline construction will take the $2,750,000 remaining of the bond money. In 1948, the San Diego Aqueduct delivered 20,000 mg. of Colorado River water but reservoirs in the San Diego system lost 6,000 mg. from storage due to the lowest runoff since 1904.

PHILADELPHIA, PA. — The new $1,703,000 Torresdale Filtered Water Pumping Station, which will improve distribution service in half of the city, is 95 percent complete. Electric-motor-driven pumps included in the station are: Four 40-mgd. and two 20-

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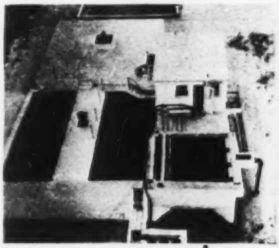

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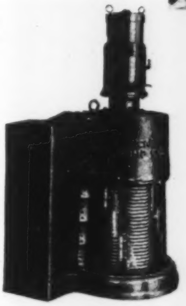

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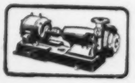

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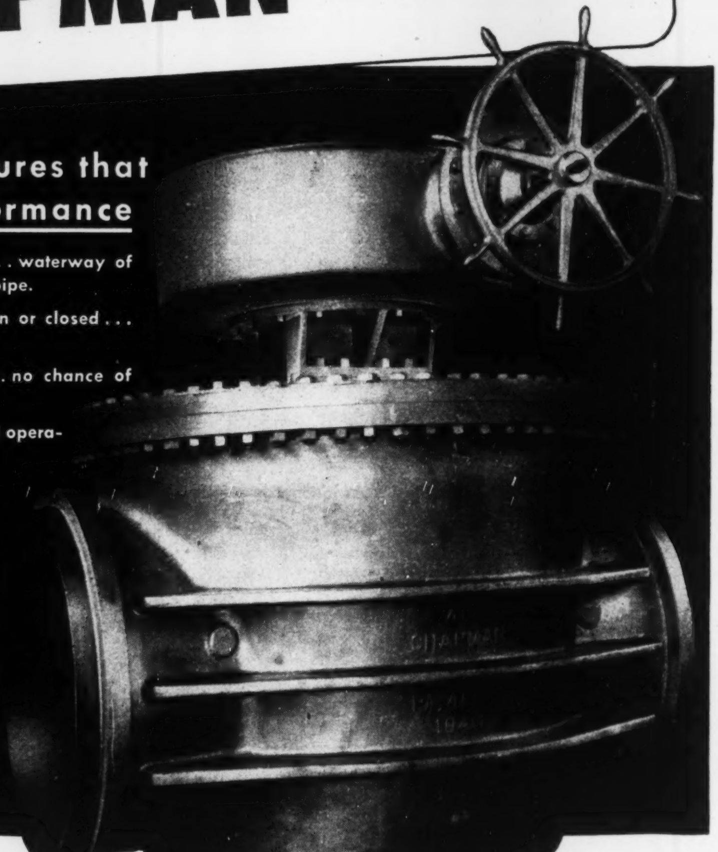

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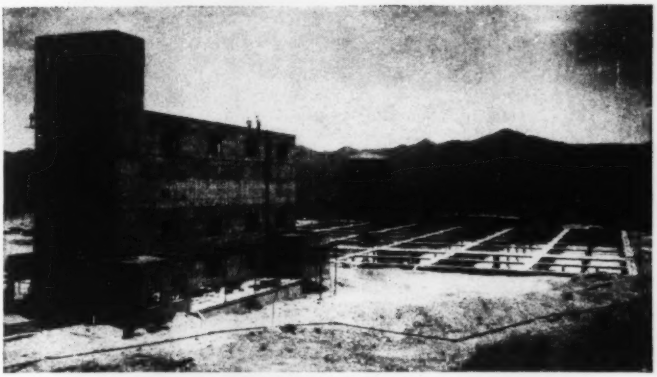
mgd. 200-ft. head units; and one 6-mgd. and three 3-mgd. 360-ft. head installations. Plans call for putting the Belmont taste-and-odor control plant with a daily ozone capacity of 1,250 lb. into operation early this year.

DENVER, COLO.–Continuing progress is reported on the $30,000,000 construction program to improve water facilities. A $1,000,000 clear-water reservoir was completed during 1948 and a like amount was spent for extension of city water mains. Now under construction, at a cost of $4,000,000 is a 10-mi. conduit designed to deliver 200 mg. of water from the South Platte River to Marston Lake Reservoir, which supplies two filtration plants. The line will be 90-in. reinforced concrete pressure pipe except for 3,000 ft. of tunnel. Some 20 mi. of cast-iron mains and 6 mi. of prestressed concrete feeder up to 42-in. dia. are planned for construction this year. Estimated cost is $1,500,000. Also included in the expansion program are a large reservoir to store flood waters, development of additional sources of supply in the mountains near the city, new conduits for delivery of raw and filtered water, and a substantial increase in treatment-plant capacities.

DAYTON, OHIO—Work will start this year on a 96-mgd. softening plant to treat water from 30 wells on Rohrer Island in the Mad River. The natural flow of the wells will be supplemented by damming the river below the island and leading water over recharge areas that will act as roughing filters. Water will flow through an 84-in. concrete conduit to the new plant. Estimated project cost is $4,100,000.

EVANSTON, ILLINOIS — Completion this year of a $2,700,000 expansion program at the existing 24-mgd. plant for filtering Lake Michigan water will double its capacity to 48 mgd. Included are a new chemical house and service and engineering buildings. A feature of the project is complete electrification of the plant's pumping station to eliminate objectionable smoke.

MOLINE, ILLINOIS — Under a $1,415,000 waterworks improvement program, a 5-mgd. filtration plant is being converted to a 7.5-mgd. lime-softening plant. The project includes two new filters, a rapid mixing basin, sedimentation and reaction basins, and new chemical facilities. Process sludge will be centrifugally dewatered. Included in the program is a new shore well and intake from the Mississippi River, and conversion of steam pumps to electric operation.



MECHANICAL and electrical equipment is being installed in the 30-mgd., $1,500,000 water-treatment plant for Phoenix, Ariz. The project is located at the confluence of the Salt and Verde Rivers.

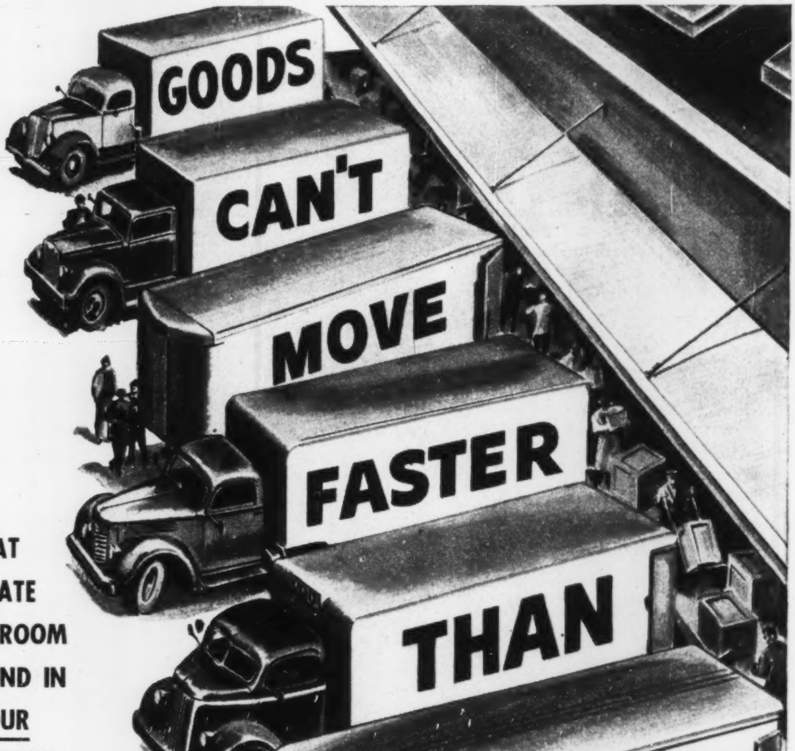
DES MOINES, IOWA—A 48-mgd. iron-removal and water-softening plant is 40 percent complete and is scheduled to go into operation late this year. The $2,100,000 lime-soda ash plant is designed to remove iron content completely and reduce hardness from an average of 325 to about 85 ppm.

LOUISVILLE, KY.—The municipally-owned Louisville Water Co. is electrifying all its pumping stations under a $650,000 program. At its Riverside Station, two 30-mgd. and one 60-mgd. pumps have already been switched from steam, and installation of an additional 60-mgd. low-lift pump is underway. At the Crescent Hill Station, three vertical 30's, one 40, and a vertical 50-mgd. pump are being installed with 13,800-v. motors. Two 13,800-v. feeders and twin busses, with an automatic switch, will prevent the motors from losing synchronization in the event of power failure in one line.

DELAWARE WATER SUPPLY—By the end of 1949 the New York Board of Water Supply will have let contracts for all major works in the present 540-mgd. development of this supply. The principal elements are: Merriman Dam in the Hudson River watershed at the terminus of the existing 85-mile Delaware Aqueduct to New York, Downsville and Neversink Dams in the Delaware River watershed; and two trans-divide tunnels, one from each of the Delaware reservoirs directly to the reservoir of Merriman Dam. The $18,120,000 Merriman Dam was 75 percent complete at the end of last year, with 1948 expenditures of $3,740,000 and completion expected by December 1949. At that time Merriman's reservoir will begin to serve New York. On Neversink Dam, $25,500,000 of an estimated $31,900,000 was spent or obligated in 1948, and the job was 22 percent complete. This work will be finished in 1953. Work began at Downsville during the year and was 22 percent toward 1953 completion in December. $7,420,000 was spent in 1948 and the remainder of a $42,000,000 total will be placed under contract this year. The 5-mile $15,640,000 Neversink-Merriman tunnel was begun at the end of 1948, for 1952 completion. The Downsville-Merriman tunnel, to be 25 miles long and cost $46,000,000, will be let in 1949.

BALTIMORE, MD.–The first $9,130,000 contract for driving a tunnel to the Patapsco River water supply, which consists of 14,200 ft. of 10-ft. dia. monolithic concrete-lined section, is about 80 percent complete. Amounting to nearly $9,717,800, the contract for the final section of the tunnel was let last year. Work consists of 51,600 lin. ft. of rock excavation to be done through three shafts and a portal and 11,000 ft. of 11-ft. dia. concrete lining. Total funds made available for water-supply improvements since 1943 was brought to $32,000,000 by action of voters in approving an additional bond issue for $9,500,000 in the November election.

AKRON, OHIO – Rehabilitation of the 34-yr.-old water-treatment plant is underway. Contracts in force of about $1,400,000 provide for furnishing and installing two 40,000-lb. per hr. steam-generating units, a 20-mgd.



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steam-driven pump, two 500-kwh. generators and electrical-control equipment. It is expected that contracts totaling about $1,200,000 for additional work will be let in 1949.

TAMPA, FLA.—Four rapid-sand filters that will increase capacity by 50 percent, a lime house with pneumatic unloader and two 15-mgd. upflow settling tanks are complete. Recently let were contracts for a boiler house; two 35,000-lb. per hour steam boilers; 25-mgd. and 20 mgd. steam-drive pumps for low and high service, respectively; and a 300 kw. turbine generator. Capacity of the plant when complete will be 32 mgd. Total cost of improvements is $2,156,030.

CHESTER, PA.—To replace the salt-encroached Delaware River supply, the Chester Municipal Authority has embarked on a $14 million water- development program. The project consists of an earth-filled dam that will impound 2 billion gal. and permit a draft of 30 mgd.; an 18-mgd. filter plant; five and 20-mg. reservoirs; four 250-ft. head pumps designed to supply from 6 to 20 mgd. in 2-mgd. increments; and force and gravity mains from the plant to the city. With the filter plant and dam about 20 percent complete and contracts for the mains to be let this year, the project is expected to be in operation early in 1951.

BOSTON, MASS.—Work on the $9,530,000 City Tunnel section of the Hultman Aqueduct is about 15 percent complete. At the end of the year 15,470 ft. of 12-ft. dia. tunnel as well as 3,240 ft. of 10-ft section had been driven. Total length of the City Tunnel is about 5½ miles. Contracts have been awarded for construction of the 24,000-ft. 48-in. and the 46,000-ft., 36-in. sections of the Chicopee Valley Aqueduct. Reinforced-concrete, steel-cylinder pipe is being delivered under a $1,500,000 order. Bids will be asked this spring for construction of the final section, control equipment and a 23-mg. reservoir. Total project cost is about $4,000,000. Studies and reports have been completed for a 25-mile, $10,000,000 aqueduct to furnish water to cities in the Merrimack Valley from the Wachusett Reservoir.

MIAMI, FLA.—A $1,600,000 project for increasing capacity of the Hialeah Water Softening plant from 40 to 40 mgd. has been completed. Included in the work were: Five new wells, mixing tanks, a 20-mgd. clarifier, carbonating and chlorine-contact basins, chemical-feed and chlorination equipment, a lime-recovery plant and a 2-mg. clear well.

DETROIT, MICH.—Total dollar volume of waterworks projects under construction in 1948 amounted to $2,623,000. Included were: The 30-mg. reinforced-concrete Northeast filtered-water reservoir; the 160-mgd. peak-load booster station with four 175-ft. head pumps; and two large feeder mains at East Eight Mile Road. The feeder-main projects consisted of a 66-in. steel-cylinder, reinforced-concrete pressure pipe, 6,300 ft. long and a 48-in., 9,700-ft. long installation of the same type. Major work to be started in 1949 is: The $1,500,000 first section of the Northeast raw-water conduit consisting of 6,000 ft. of 10-ft. dia. monolithic concrete-lined tunnel; a $250,000 pre-chlorination station with a maximum capacity of 22,500 lb. per day of liquid chlorine; 5,300 ft. each of 60 and 54-in. feeder mains at a total cost of $750,000; and $400,000 in new distribution mains. Plans are being prepared for the 180-mgd. Northeast treatment station that is estimated to cost $21,000,000.

NEW ORLEANS, LA.—At a total of about $1,414,000, 52,780-ft. of new water mains were added to the distribution system, 2,400-ft. and 3,400 ft. of 30-and 24-in. cast-iron pipe, respectively, were installed in the business section to improve pressures, and 13,150 ft. of 50-in. steel pipe were purchased in 1948. The steel pipe will be lined with concrete mortar and installed as the first section of a 50,000-ft. cross-town main.

DISTRICT OF COLUMBIA — The Corps of Engineers plans to start work this fall on a new $3,000,000 Del Carlia pumping station, which will have 16 vertical pumps of from 10 to 100 mgd. capacity. The 250-mgd. high-lift station will serve all five different pressure zones within the District, and is part of a $45,000,000 modernization program. The District itself will take bids soon for its 290-mgd. Bryant St. pumping station. Pumps for the $2,500,000 installation have already been ordered.

TRANSPORTATION

NEW HAMPSHIRE TURNPIKE—Following the lead of Maine, New Hampshire last year placed this 15-mi. 4-lane road under construction, at a contract price of $5,251,024. The route continues southward parallel to the coast from the lower terminus of the Portland-to-Portsmouth (N. H.) Maine Turnpike, to the Massachusetts line. Ten percent of the work was done by Jan. 1 this year, and completion is scheduled for July 1, 1950.

MYSTIC RIVER BRIDGE—Local and coastwise vehicular traffic will move faster in Boston next year when the $27,000,000 Mystic River Bridge, between the city's Charlestown section and Chelsea, is opened. Now 25 percent complete, the bridge will carry two three-lane decks on most of its 2-mile length. A 1,524-ft. cantilever bridge, the project's biggest element, will have an 800-ft. central span 140 ft. above the water.

EAST BOSTON EXPRESSWAY—Another heavily-traveled route, from downtown Boston northeastward through the Sumner tunnel to East Boston, Logan Airport and northern shore points, will carry more traffic upon completion of this $10,000,000 elevated roadway project in East Boston. The main work is 6,850 ft. long and a connecting ramp to the airport is 3,000 ft. long. The first contract, for more than $6,000,000, now is under way.

BOSTON BELT HIGHWAY—Almost four miles of the four-lane divided highway that eventually will loop around Boston, from Gloucester, 30 miles northeast, to Nantasket, 15 miles southeast, were put under construction in 1948, at a contract cost of $2,300,000. This work was one-third complete at the end of the year. Previously, since 1936, 14 miles had been completed. In addition, during the year, approach fill for an important link in the highway, the $4,700,000 bridge across the Annisquam river in Gloucester, was finished. Work began on the substructure, and the superstructure will be let this summer. The main arch span will be 420 ft. long, with its deck 95 ft. above water.

CONNECTICUT HIGHWAYS—New Haven's West Rock, most important obstacle remaining in the Merritt-Wilbur Cross system that connects New York with Boston, was pierced by two-lane bores during the year. The $1,935,000 job should be complete by June 1949. In addition, grading and drainage on seven more miles of the **Wilbur Cross Parkway** ($1,308,000)

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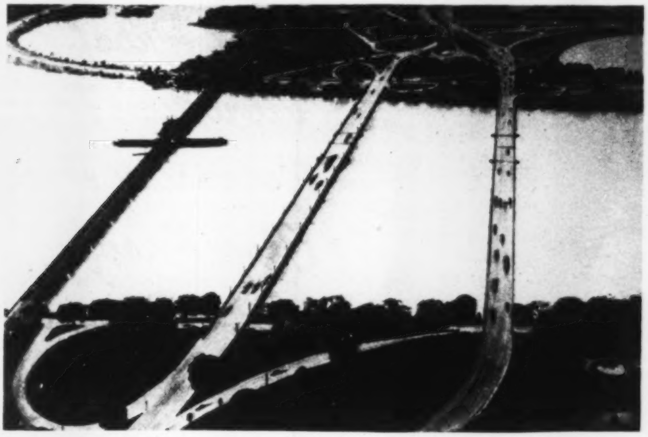
CALIFORNIA FREEWAY. The Bayshore Freeway is one of the major developments in California Freeway construction program.



TWIN POTOMAC CROSSINGS. Sketch on aerial photograph (looking south to Virginia) of 14th St. bridge sites in Washington, D. C. shows how new northbound East Bridge and reconstructed southbound West Bridge will look when project is complete. For time being, old truss bridge on west site will continue in use.

were 90 percent complete at the end of the year, and one mile was paved. Six more miles will be paved this year. Eight new bridges were 30 percent complete. Five miles of 4-lane and eleven miles of 2-lane concrete pavement were built on the **Wilbur Cross Highway.**

BROOKLYN-BATTERY TUNNEL—This is another tunnel that will eliminate the bottleneck between existing express routes. The routes in this case are New York's **West Side Highway** and Brooklyn's **Belt Parkway** system. Connections to other routes, including the East River Drive, eventually will be made. $20,000,000 was spent or obligated during 1948 on the $82,000,000 tunnel project, now 80 percent complete, and $16,000,000 more will be committed in 1949. Each of the 9,117-ft. two-lane bores was holed-through during 1948. Operation is scheduled for the summer of 1950.

NEW YORK EXPRESSWAYS—In New York City, four contracts amounting to about $8,380,000 for 2.7 miles of the $20,000,000 **Van Wyck Expressway** between Jamaica and Idlewild Airport constituted the bulk of work on the city's expressway system. The most important project is a $2,530,000 three-year reconstruction of a grade separation in Jamaica, to provide more headroom and four more traffic lanes under 13 existing railroad tracks. **Brooklyn-Queens Expressway** contracts for $4,470,000 will furnish a mile and a half of miscellaneous road work, as well as the **Meeker Avenue Viaduct** superstructure. Little work was done on the $39,000,000 **Cross-Bronx Expressway**, but somewhat more than $1,000,000 was started on **Major Deegan Expressway**, also in the Bronx.

The foregoing are financed mostly by the state. The city completed its **West Side Elevated Highway** by putting the final 3,200 ft. at the southern end into service in November. A $4,380,000 contract for the work had begun in March 1947.

Outside the city, on Long Island, four miles will be added to **Northern State Parkway** by $2,310,000 in contracts let during 1948. And the state's biggest grade separation and railroad elevation project, .62 miles in **Rockville Centre**, went for $4,800,000 late in the year. In addition, $4,250,000 were obligated for ten miles of the 486-mile state **Thruway** that will run up the west side of the Hudson, to Albany, then westward through Buffalo and along Lake Erie to the Pennsylvania line.

NEW JERSEY HIGHWAYS—**Route 100 Freeway**, a new road from the George Washington Bridge to the Raritan River, advanced in 1948 as contractors brought in fill to reclaim land for the right of way. Land acquisition and grading proceeded on **Route 4 Parkway**, which ultimately will connect Paterson with Cape May. The state paved 25 miles of dual highway (filling several gaps in arterial routes), graded 2.7 miles of multiple highway and built 30 bridges during the year. $30,000,000 is scheduled to be obligated in 1949. Toll roads, perhaps

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● When your plans call for pipe and fittings on new work, remodeling city projects or for water service lines, investigate STREAMLINE Copper Pipe and Solder Fittings before you decide.

STREAMLINE compares very favorably in cost with ferrous pipe, yet, with the exception of abnormal soil and water conditions, it never has to be replaced due to rust or clogging. The pipe joint is actually the strongest point in the line—constant vibration, resettlement of the fill, etc. has no effect upon it.

STREAMLINE Service Pipe (Type K) is the original copper service pipe, and the first to be produced in America for water service work. It is the most uniformly soft and pliable pipe possible to obtain—it is kept that way through the use of the best copper obtainable for the purpose and through strict laboratory control through every phase of its manufacture.

STREAMLINE Fittings and Type K Copper Pipe are the ideal materials for water works use; for many applications in filtration plants; in aeration lines and in heating coils using the sludge digestion system in sewage disposal plants—and for all general plumbing and heating purposes.

Water works officials who are responsible for the return on a very heavy capital investment have in STREAMLINE fittings and copper pipe, one of the most effective and low cost forms of insurance that they can adopt. It is the ideal material for water service work. Include them in your specifications for postwar planning.

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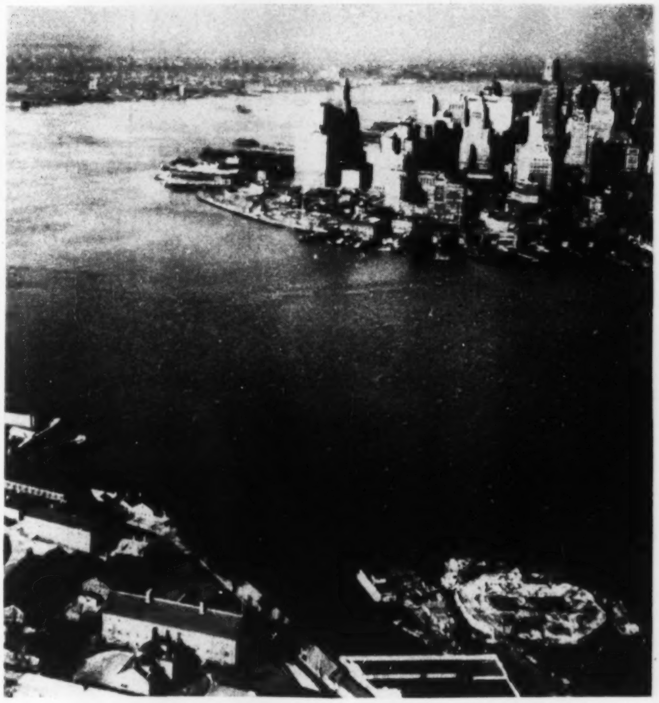
engineered by consultants, were authorized by the legislature, and it is possible the **Route 300 Freeway,** connecting Route 100 with the New Delaware River bridge below Wilmington, will be built under this authorization.

DELAWARE BRIDGE—Estimated at $35,000,000, this new memorial bridge will replace the Newcastle-Pennsville ferry below Wilmington. It will be a four-lane structure with a main suspension span of 2,150 ft., 175 ft. above the water. Initial work, represented by $16,000,000 in contracts for all foundation work between abutments, began last Summer. The $13,700,000 superstructure contract was let early in 1949, and completion of the entire project is expected by June 1, 1951.

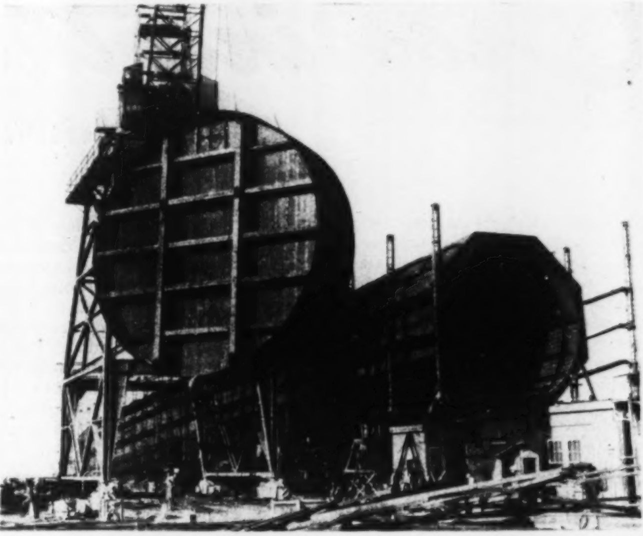
BALTIMORE-WASHINGTON EXPRESSWAY—Although a fast highway extends from the **Delaware Memorial Bridge** site to Baltimore, the 30 miles beyond the Nation's capital remain inadequate. However, the federal government already has improved part of the road, and on twelve miles the state of Maryland now is building a limited-access road, paved four or six lanes on a 300-ft. right-of-way. The project includes bridges at two streams and a railroad, six road grade separations and an interchange for a half-mile airport service road, also part of the work. $4,750,000 of the project's estimated $14,300,000 cost was obligated by the state in 1948 and the remainder will be contracted this year. One percent completion was estimated at the end of December, 1948.

DISTRICT OF COLUMBIA—A vital link in coastwise travel, the $5,800,000 **East Bridge** across the Potomac River next to the old 14th St. Bridge will be placed in service in November. The new bridge, with its bascule channel span, will carry four lanes northbound and the old will carry southbound traffic. Later, the old bridge will be torn down and replaced. Elsewhere in the capital, the new $5,400,000 **Victory Bridge** across the Anacostia River also will be complete in November. A swing span will provide two 150-ft.-wide passages for shipping. **Whitehurst Freeway,** the $3,350,000 K Street elevated approach to Key Bridge will be complete in May, and the $3,800,000 **DuPont Circle Underpass** will be put in service in December.

SHIRLEY HIGHWAY—One more traffic-choked city, Alexandria, Va., will be bypassed by Atlantic Coast



AIR FOR BROOKLYN-BATTERY TUNNEL. Man-made island at lower right is top of Governors Island shaft, half way between Brooklyn and Manhattan. Blowers handling nearly 4,000,000 cfm. will be built here, to ventilate half of the tunnel. (New York Herald-Tribune photo.)



HOUSTON TUNNEL SECTION. Shipyard crane moves bulkhead to place on tunnel section prior to test for water tightness and launching for sea journey from Pascagoula, Miss. to Houston Ship Channel tunnel site.

Crossing the Pecos

IN SOUTHWESTERN TEXAS

As breath-taking as the rugged country in which it stands, the Pecos River Bridge is one of the highest and most-talked-of railroad bridges ever constructed. It was awarded the American Institute of Steel Construction's annual prize for 1944 as the most beautiful railroad bridge in the United States. The structure carries Southern Pacific's mainline transcontinental traffic across the 330-ft-deep Pecos Canyon. It is a modern continuous-cantilever truss span, with a single plate-girder approach span at each end, its tremendous weight being borne by six piers and abutments of heavily reinforced concrete. It is 1390 ft long, and its two center piers, extending to the floor of the canyon, are 265 ft above normal water level. Into its huge substructure was poured 15,455 tons of concrete.

The huge superstructure of the Pecos River Bridge, weighing some 2700 tons, was fabricated and erected by Bethlehem.

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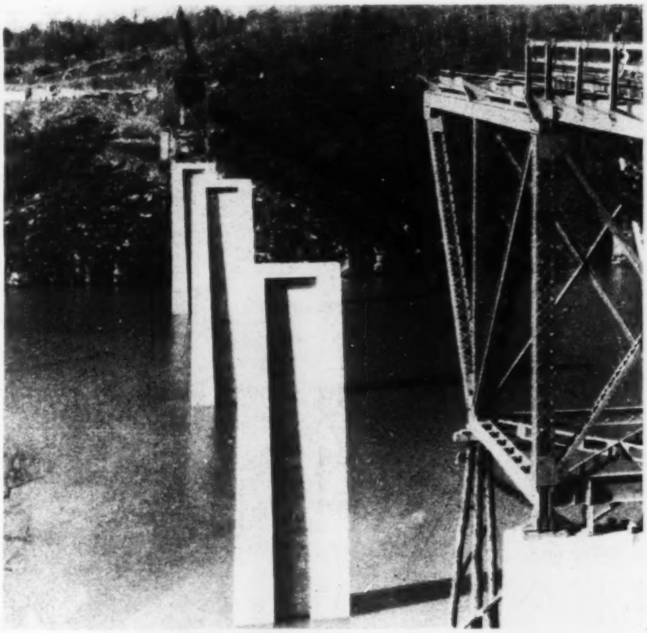
traffic when this 17.3-mile expressway is put into service (part of it two-lane) late this year. Obligations amounting to $500,000 were made in 1948, bringing the total to $5,000,000. Finishing the four-lane work, to cost $1,000,000, will take place in 1950 or later.

BLUE RIDGE PARKWAY—During 1948, expenditures amounted to $1,500,000 on this 476-mile two-lane route extending into North Carolina from the Skyline Drive in Virginia. Addition of eight miles of grading and 2 miles of paving brought the construction status to 245 miles paved, 77 miles with crushed stone base and 6 miles graded only, with 23 miles of paving and 8 miles of grading to be completed under existing contracts. About $1,800,000 will be spent in 1949.

PENNSYLVANIA TURNPIKE — Long-planned eastward extension of the Pennsylvania Turnpike to the vicinity of Philadelphia got under way in September. By January $2,971,000 had been obligated on this 90-mile job, and $44,000,000 will be committed this year. Seventy-seven percent completion is scheduled for the year-end, and the route should be open for traffic in the fall of 1950.

PENN-LINCOLN PARKWAY — Over $20,000,000 worth of construction contracts have been awarded to date on the Penn-Lincoln Parkway in Pittsburgh, Pa. Of this amount, $15,550,000 was awarded last year. Eleven bridges were completed during the year, and another will be finished soon. **Squirrel Hill Tunnel**, carrying two traffic lanes in each of its twin tubes, was started last summer, while the $1,800,000 three-arch **Commercial Avenue Bridge** was more than half completed at the end of the year. Scheduled for contract letting this year is the **Frazier Street Bridge**—a five-span deck truss bridge to carry the parkway over railroad tracks and three existing streets.



CANEY FORK BRIDGE. Functional simplicity is characterized by the straight lines of 215-ft. piers completed last year for the Corps of Engineers' 1,787-ft. Caney Fork River bridge which will carry Tennessee State Highway 56 above water impounded by Center Hill Dam. Superstructure contains two cantilever trusses with 387-ft. anchor span and 148-ft. cantilever arms, and two 235-ft. suspended spans.

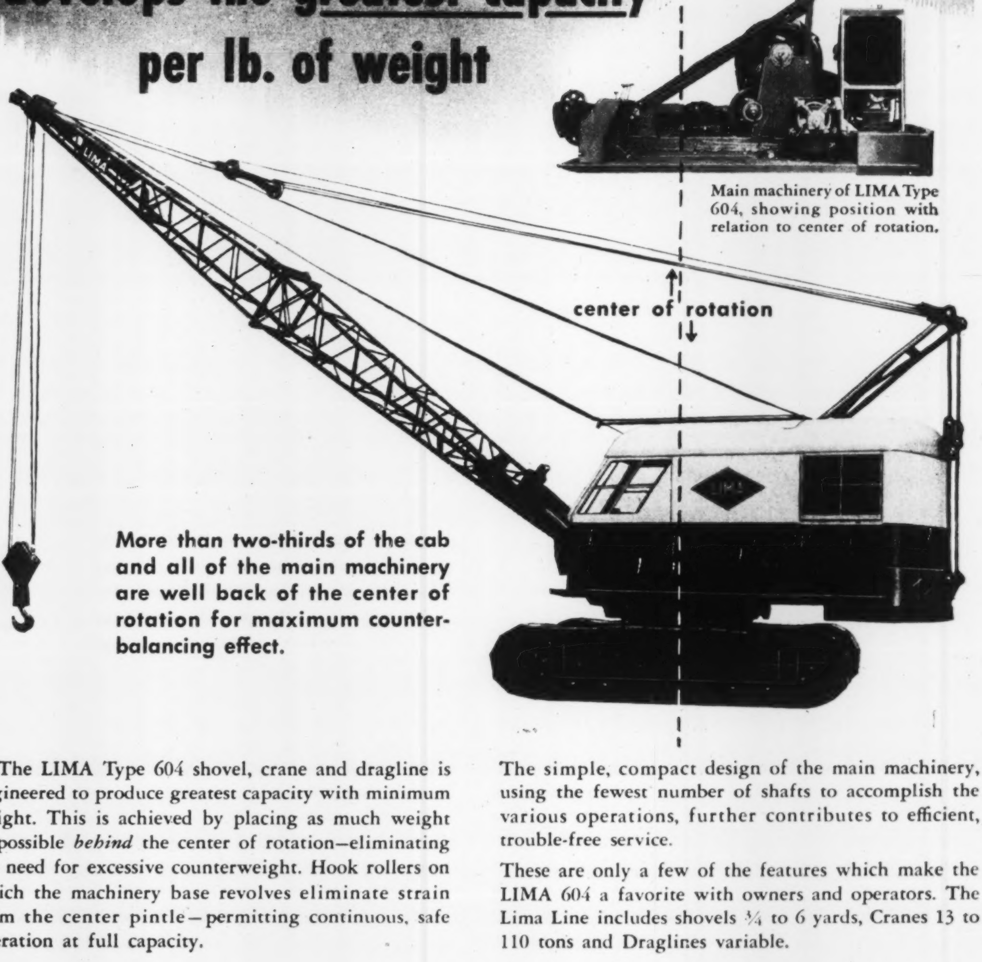
CLEVELAND FREEWAYS — Current contracts for $5,802,000 worth of construction on 3.5 mi. of the north-south **Willow Freeway** will be completed this year, and contracts will be awarded for an additional 0.8 mi. of work, to cost $1,200,000. Right-of-way costs for the 4.3 mi. of freeway will total about $3,050,000. Contracts totaling $800,000 for 3.1 mi. of concrete paving on the north-eastward **Lakeland Freeway**, and $1,448,000 for a grade-interchange structure were awarded late last year, for completion in 1949. This year, contracts will be awarded for 1.0 mi. of additional construction on the freeway at an estimated cost of $4,000,000.

DETROIT EXPRESSWAYS — Construction on the **Edsel Ford Expressway**, which joins the **Willow Run-Detroit Industrial Expressway** and will extend easterly across the city was advanced last year—contracts totaling $1,540,000 were completed and $2,807,000 worth of work was placed under contract. An estimated $5,249,000 worth of work is expected to be put under contract this year. Construction contracts completed last year on the north-south **John C. Lodge Expressway** totaled $2,225,700, while $859,800 worth of work was placed under contract. An estimated $3,666,000 worth of construction is expected to be placed under contract before the end of this year.

PEORIA BRIDGE—The $2,160,000 Harvard St. Bridge over the Illinois River at Peoria, Ill., was completed in December by the Illinois Division of Highways. Construction of the high-level, 4,695-ft. structure was started

DENVER FREEWAY WORK. Dragline backfills a 72-in. sewer under the proposed location of the Denver (Colorado) Valley Highway.

Why the LIMA Type 604 develops the greatest capacity per lb. of weight



Main machinery of LIMA Type 604, showing position with relation to center of rotation.

More than two-thirds of the cab and all of the main machinery are well back of the center of rotation for maximum counter-balancing effect.

● The LIMA Type 604 shovel, crane and dragline is engineered to produce greatest capacity with minimum weight. This is achieved by placing as much weight as possible *behind* the center of rotation—eliminating the need for excessive counterweight. Hook rollers on which the machinery base revolves eliminate strain from the center pintle—permitting continuous, safe operation at full capacity.

The simple, compact design of the main machinery, using the fewest number of shafts to accomplish the various operations, further contributes to efficient, trouble-free service.

These are only a few of the features which make the LIMA 604 a favorite with owners and operators. The Lima Line includes shovels ¾ to 6 yards, Cranes 13 to 110 tons and Draglines variable.

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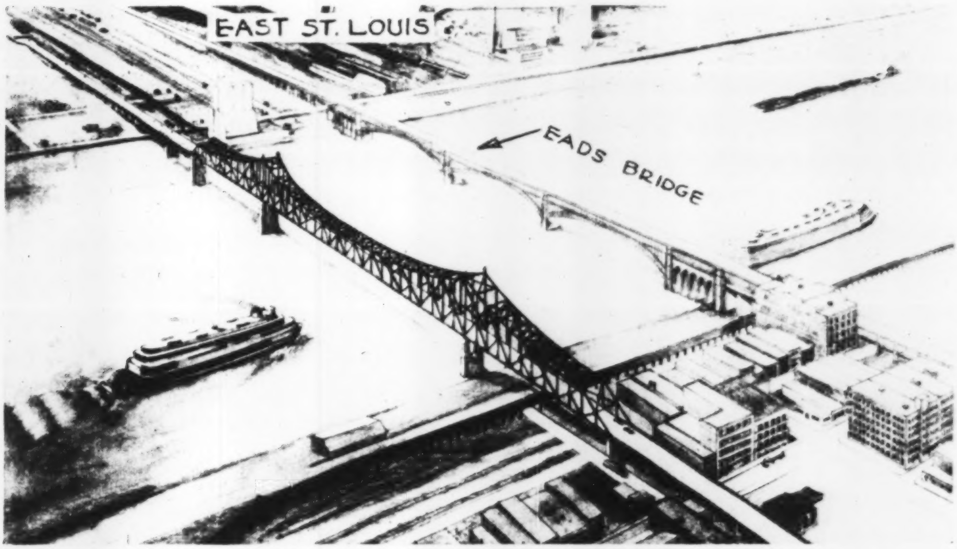

MISSISSIPPI BRIDGE. Construction began last summer on this new cantilever structure across the Mississippi River, upstream from historic Eads Bridge between St. Louis and East St. Louis.

in 1940 but was suspended during the war. The 536-ft. main span gives a 66-ft. vertical clearance over the navigation channel, and is flanked by 469-ft. side spans to make a three-span continuous through truss.

MINNESOTA BRIDGES—An 1,825-ft. **Mississippi River bridge** with 32-ft. roadway is under construction at Hastings to replace an inadequate span with a dangerous spiral approach. Late last year contracts were let for the north abutment and eight piers ($440,000) and steel superstructure ($1,040,000). The main span is a continuous tied steel arch with 514-ft. center and 225-ft.. side spans. The concrete approach and decking will be let this year, for project completion in 1950. Minnesota, jointly with Wisconsin, will begin work this year on a $4,000,000 project for a 2,310-ft. through truss bridge over the **St. Croix River.**

EUCLID AVE
EUCLID AVE

NEW SUBWAY STATION. New York subway work in 1948 included completion of the Fulton St. extension in Brooklyn.

EAST ST. LOUIS BRIDGE—The construction of the new toll bridge over the Mississippi River just upstream from Eads Bridge was started by the city of East St. Louis, Ill., in the summer of 1948 under a $6,490,000 contract. The four-lane structure has a total length of 7,620 ft., including a 1,904-ft. cantilever span (a 964-ft. channel span plus two 470-ft. anchors). East side approach piers already have been completed and erection of 8,100 tons of superstructure steel will start this spring. An accelerated progress schedule envisions completion of the bridge in August, 1950.

NEW ORLEANS TUNNEL—The City of New Orleans plans to begin work this year on the $8,500,000 St. Claude Ave. tunnel. The facility will carry pedestrian and four-lane vehicular traffic beneath the forebay of the St. Claude Ave. lock of the industrial Canal connecting the Mississippi River and Lake Ponchartrain. Length between portals of the tunnel will be 1,800 ft.

MISSOURI EXPRESSWAYS—A $1,700,000 contract was recently awarded for a 2,950-ft. six-lane divided viaduct—the first work on the **Kansas City Southwest Trafficway,** itself the first Missouri expressway project under the urban program. The viaduct will span the Kansas City Terminal Railroad and all cross streets from 20th to 25th

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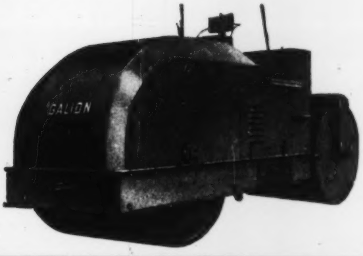

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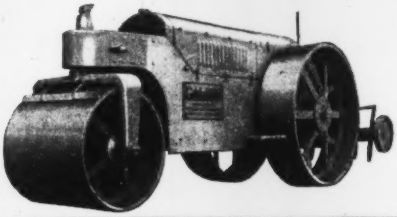

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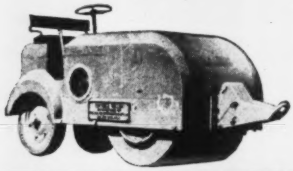

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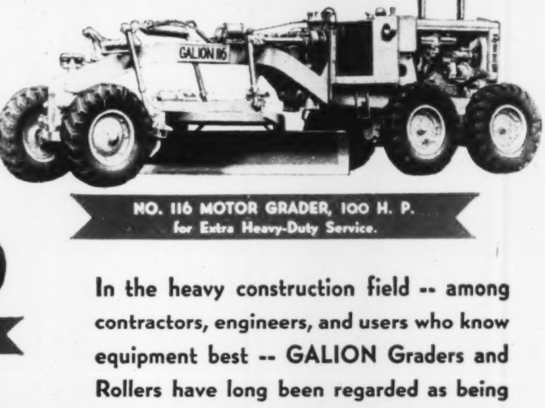

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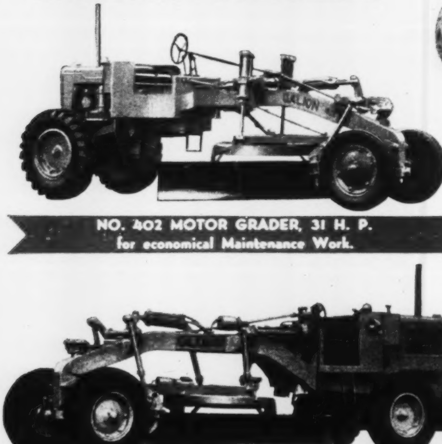

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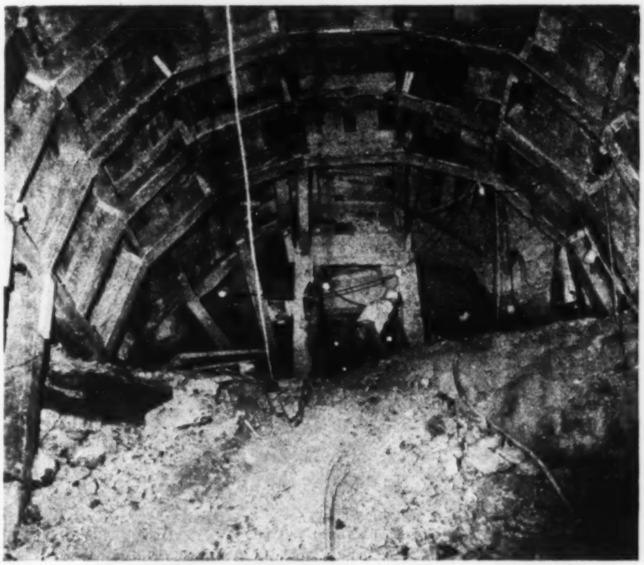
St. The state also hopes to contract this year for a portion of a depressed expressway in **St. Louis.** Estimated project cost is $2,500,000, including right-of-way.

TEXAS EXPRESSWAYS–Over $24,000,000 has been spent on Texas' major urban expressway program, aimed at 1951 completion, and $7,000,000 is earmarked for 1949 contracts. In general, the expressways are divided roadways of four, six or eight lanes, flanked by two-lane service streets. **At Dallas,** the $18,000,000 **Central Boulevard Expressway** is under construction to shorten by 1.3 mi. and 22 min. the north-south travel time through the city on U. S. Route 75. Through 2 mi. of downtown Dallas, the highway will utilize two widened existing streets pending construction of an elevated connection between the north 3.6-mi. and south 2.7 mi. sections. Also on U. S. 75 is an urban expressway fringing the **Houston** business district. Sections of the project, leading southeast toward Galveston, have already been completed under a $5,250,000 contract. At **Ft. Worth,** work is in progress under a program for two expressways that will cross the city from north to south and east to west, while two similar projects are planned for **San Antonio.** Much of the 12 mi. through the city will be depressed.

HOUSTON TUNNEL–The first of four 375-ft. long 32-ft. dia. prefabricated steel tube sections for the $7,500,000 Pasadena vehicular tunnel beneath the Houston, Texas Ship Channel has been delivered. A second tube has been launched; the others will be delivered this spring. Work is well along on 1,450 ft. of cut and cover concrete approach tunnel and 850 ft. of open ramp on the 3,900-ft. project, which is expected to be open to traffic by the end of the current year.

GALVESTON TUNNEL–Negotiations for completion of financing are well advanced and bids have been taken for construction of a $17,000,000 toll tunnel across the entrance to Galveston Bay, in Texas. First work on the project is scheduled for this spring. A feature of the 3¼-mi. project will be construction of a 1,200 x 200-ft. artificial island for a transition between a ¾-mi. concrete trestle and mile long tunnel.

DENVER VALLEY HIGHWAY–Under a $2,225,000 contract, work has begun on the first 2¼ mi. of a $25,000,000 expressway along the South Platte River to carry north-south traffic around Denver's main business district. The limited access highway will have two 2-lane roadways separated by a wide median strip on which two additional lanes will be built later. Eleven major traffic interchanges are planned, as well as a crossing over the South Platte.



WESTERN TUNNEL. Top drift of Aspen tunnel, part of a relocation project that will complete the Union Pacific double track from Omaha to Ogden.

ALASKAN WAY VIADUCT–Construction will start in April or May on this $6,300,000 double-deck expressway in **Seattle, Wash.** The viaduct will carry traffic through the downtown section, which is situated on a relatively narrow neck of land between the industrial (south) and residential (north) parts of the city. The project will include 4,550 ft. of double-deck structure and have a total length (including ramps) of 7,600 ft. Each deck will be 40 ft. wide and carry 3 lanes of one-way traffic.

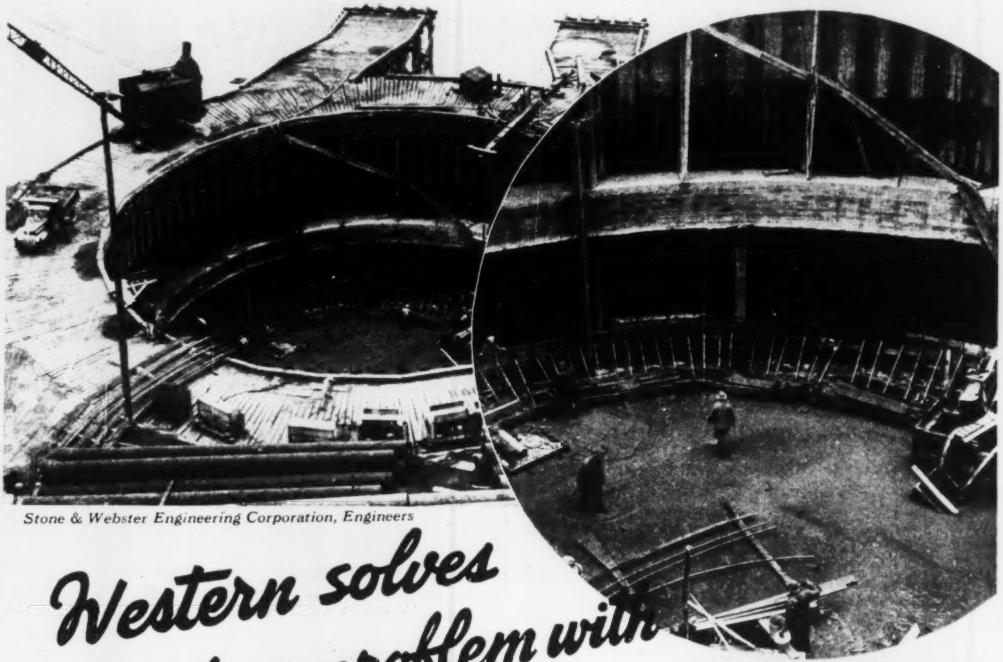
TACOMA NARROWS–After a brief delay to arrange additional financing, a contract was let early in 1948 for rebuilding the Tacoma Narrows Bridge. First steel for the towers of the $14,000,000 bridge was raised in January, 1949. Completion is set at July 1, 1950. During 1948 the old piers were recapped.

COLUMBIA RIVER HIGHWAY–Final contracts for grade separations and pavement will be let in 1949 for the 18½-mile relocation of the Columbia River Highway through the Columbia River gorge east of Portland, Ore. Total construction cost of the project will be $6,650,000. A 5.35-mile extension is contemplated, estimated by engineers at another $1,035,000.

HARBOR DRIVE EXPRESSWAY–Work on the entire 3.36 miles of this six-lane arterial for Portland, Ore., will be contracted for by the end of 1949. Already under way are $3,850,000 of contracts. Contracts for 0.83 miles of roadway and two articulated traffic interchanges, estimated to total $1,500,000, are to be let.

CALIFORNIA BRIDGES – More than $17,000,000 each year is being spent on highway bridges in California. Much of the work is on interchange structures on freeways but several other major structures were under contract in 1948, including the **Moyo River Bridge** ($760,000), **Weitchpec Bridge** across the Klamath River ($610,000), **Three Miles Slough** ($780,000), **Mossdale Bridge** across the San Joaquin River ($665,000) and major rail-highway grade separations in Sacramento ($825,000) and **Roseville** ($1,500,000).

SAN FRANCISCO CROSSINGS–Finishing up a year-long study, the Bay Toll Crossing Division of the



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LA GUARDIA DIKE. Strategic sections of this dike around subsided portions of La Guardia Airport, New York, were completed in time to prevent inundation of the huge airfield by 1948 high autumn tides.

California Department of Public Works recommended immediate construction of a $155 million bridge paralleling the existing Bay Bridge. The Toll Bridge Authority is expected to decide soon whether to build the recommended bridge or a low-level crossing between San Francisco and Alameda. If a parallel bridge is chosen, construction can start in 1950.

CALIFORNIA FREEWAYS – Further sections of the **Santa Ana Parkway** in the southern part of the state and the **Bayshore Freeway** in the north were open for traffic in 1948. Contracts for major freeways in effect at the end of the year total as follows: Hollywood–$8,076,800, Santa Ana–$3,064,800, Bayshore – $3,141,700, and Eastshore–$5,638,600. Still to be obligated this fiscal year is $1,274,000. Budgeted for freeway construction for the fiscal year starting July 1 is $15,000,000 in the Los Angeles area and $8,000,000 in the Bay region.

BOSTON SUBWAYS – Expenditure of $2,250,000 in 1948 brought to $3,000,000 the amount spent since mid-1947 on a 2.1-mi. extension of rapid transit facilities in East Boston. The terminus of present work is the Orient Heights station of the defunct Revere Beach and Lynn Railroad. The project includes 2,000 ft. of subway, 1,180 ft. of ramp and the remainder at grade. One station will be at the edge of Logan Airport. Expected completion date is Dec. 31, 1950.

NEW YORK SUBWAYS–One extension was completed and another was well along, on New York's Independent subway at the end of 1948. The **Fulton St. Extension** in Brooklyn, for which the structure had been built in previous years was equipped for operation at a cost of $8,000,000, under contracts begun in 1946 and 1947. A $5,533,000 contract for ½ mile of 4- and 8-track structure on **Hillside Avenue, Queens,** begun in November 1946, was 70 percent along in December. Completion of the contract is expected in October of this year. The other major program, $13,000,000 of platform extensions at 32 Interborough stations, was 98 percent complete. Work began early in 1947 on this project, which will increase the capacity of local stations from 5- to 10-car trains.

NORFOLK AND WESTERN RY. –Railroad bottlenecks also are being eliminated here by tunnel construction. The Norfolk and Western Ry., for instance, is building a 7,000-ft. double track tunnel near Bluefield, W. Va. This is part of a 5¼-mile relocation that will replace a single-track tunnel and reduce the eastbound grade to 1.4 percent. Relocation cost is $11,500,000. Work started Jan. 1, 1948, was 27 percent complete at the end of the year, and will be finished in mid-1950.

CHICAGO SUBWAYS – Tunneling under a $8,235,000 contract for the southern section of the **Milwaukee Ave.-Dearborn Ave.-Congress St.** subway is now completed, including twin tubes beneath the South Branch of the Chicago River at Congress St. in anticipation of future westward extension of the line. Tunnel lining is in place. Final work under this contract is scheduled for summer completion. Installation of track, contact rail and duct banks is more than 50 percent complete under a $1,188,000 contract. The remainder of work will be undertaken this year.

MISSOURI PACIFIC RAILROAD –Extensive line and grade improvements between Bismark and Piedmont, Mo., will eliminate helper service now required on this stretch of the main line south from St. Louis. Curves are being reduced to 2 deg. maximum, from as much as 8 deg., and heavy grades up to 2.45 percent are being lowered to 1.25 percent compensated. Work at Tip Top Hill, now nearly complete, involved blasting and excavating 2,000,000 cu.yd. of hardpan from a 4,000 x 50 ft. cut, 150 ft. deep, with 1½ to 1 side slopes. Similar work at Gads Hill is now underway. This $1,000,000 project will shorten the line by 2.3 mi. and eliminate 434 deg. of curvature.

UNION PACIFIC RAILROAD – Expected opening of a second tunnel at **Aspen, Wyo.,** late this year will complete the U.P.'s double track between **Omaha** and **Salt Lake City.** A pilot tunnel for the $8,000,000, 7,600-ft. bore was holed through in December. Among other major U.P. projects completed during 1948 were a $3,500,000, 40-track retarder yard and $750,000 freight station at **North Platte, Neb.,** and a million-dollar 21½-mi. new line from **Ft. Hall** to **Gay,** in

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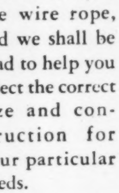

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Idaho. Scheduled for 1949 completion is a 2½-mi., $1,200,000 double-track to be installed near **Thayer Junction, Wyo.**

LIMESTONE AIR FORCE BASE–The first stage of this northern Maine facility for heavy bombers, started from scratch in April 1947, will be finished in June, at a cost of $18,000,000. Eighty percent progress was recorded at the end of 1948, and $14,300,000 was spent during the year. A 10,000-ft. bituminous runway, with taxiways and apron, was complete and a 340-ft. span reinforced concrete hangar was enclosed. Other construction includes a control building, barracks, railroad service and access roads for the base.

BOSTON AIRPORT–With four 7,000-ft. runways already built and in use at Logan International Airport, the Massachusetts Department of Public Works in 1948 turned its attention primarily to permanent buildings. Work began on a $4,250,000 terminal building near the field's center, and on a $1,036,000 heating plant at the edge, as well as several other facilities. About $12,000,000 was spent during the year.

NEW YORK AREA AIRPORTS–Airport construction by the Port of New York Authority, now operator of four major facilities in the New York area (LaGuardia and Idlewild in New York and Newark and Teterboro in New Jersey) took place primarily at Idlewild (New York International Airport.) Temporary terminal facility construction, mostly expanded quonset huts, provided 105,000 sq.ft. of floor space; an 8,400-ft. concrete runway was built during the year, and a $4,500,000 federal building on the field's margin, begun in July, will be finished this year. At LaGuardia, a $1,500,000 marginal dike and sand-pile job, to keep high tides from the field and to stabilize the peripheral fill, was started in August, for completion this spring. The airport continues to operate at full schedules while contractors carry on the stabilization work.

BALTIMORE AIRPORT–$12,000,000 of $14,000,000 has been obligated on the Friendship International Airport 9 miles south of the city's center. This amount includes the terminal building contract, on which work was started just before the year-end, for early 1950 completion. Three runways, one paved 9,450 ft. and two paved 6,500 ft., are 95 percent complete.

LARGEST OFFICE BUILDING in Los Angeles, the air-conditioned General Petroleum Building is 13 stories high.

BUILDING AND HOUSING

AMERICAN ENKA CO.—Production started in June in the $20,000,000 rayon tire yarn factory at Lowland, Tenn. Of steel and brick construction, with a precast concrete roof, the plant contains more than 500,000 sq. ft. of floor and extensive heating, ventilating and air-conditioning installations.

BROOKHAVEN NATIONAL LABORATORY—Located at Upton, L. I., the nation's first peacetime atomic pile will be in operation late this spring. Other phases of the project, including the pile laboratory, a "hot" laboratory and a cyclotron building will be completed later this year.

BUREAU OF MINES—A $10,000,000 coal hydrogenation demonstration plant for producing synthetic liquid fuels from coal was virtually completed in 1948 at Louisiana, Mo. The plant is equipped to operate on any type of U. S. coal or lignite, and has a capacity of 200 to 300 bbl. of gasoline per day. Construction of another coal-to-oil demonstration plant at the same location was begun in 1948. This gas synthesis plant will operate on the oxygen gasification of coal and Fischer-Tropsch synthesis to produce gasoline, diesel fuel and chemicals. It is expected that the coal gasification portion of the plant will be in operation late this year.

CORN PRODUCTS REFINING CO.—Spring completion is predicted for the plant at Corpus Christi, Texas, which will house a new process for manufacturing starch, dextrose sugar

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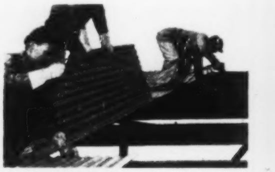

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and high-protein cattle feed from milo maize. Grain elevators with a storage capacity of 2,000,000 bu. have been completed. Open-type construction is used extensively in the processing buildings.

E. I. DU PONT DE NEMOURS & CO.—The birthplace of nylon and neoprene—the experimental station near Wilmington, Del.—is undergoing a $30,000,000 expansion, which is now about 10 percent completed. In addition to the enlargement of existing laboratories, 25 new service laboratory and semi-works buildings are being erected. In July, production started in the $20,000,000 nylon yarn factory near Chattanooga, Tenn.—the third of its type in the U. S. A feature of this plant is the use of precast insulated concrete panels for the exterior walls. Also completed during 1948 was the 17-building plastics plant at Parkersburg, W. Va.

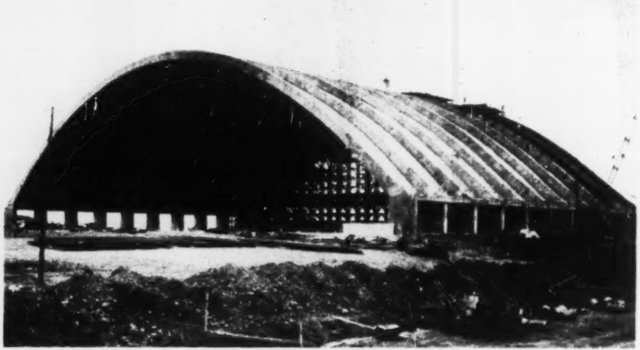
LINCOLN-MERCURY AUTOMOBILE ASSEMBLY PLANT at St. Louis, Mo., providing 850,000 sq. ft. of floor, is one of several large factories built by Ford Motor Co. Others are at Los Angeles, Metuchen, N. J., Canton, Ohio, and Mound Road, Detroit. (Albert Kahn Associated Architects and Engineers photo)

GENERAL ELECTRIC CO.—The world's largest turbine plant—also the world's largest field-welded industrial building—will be completed this year at Schenectady, N. Y., at a cost of $30,000,000. The factory will be 650x1,290 ft. An attached 4-story air-conditioned office building will have exterior walls composed of cellular, insulated panels faced with stainless steel and backed with carbon steel. Start of construction on an experimental atomic power plant near West Milton, N. Y., and opening of the first wing of the $18,000,000 research laboratory near Schenectady, N. Y., were two highlights of research activities during the year. Others include placing of the jet engine testing lab in partial operation at the $25,000,000 jet research center at Lynn, Mass., and start of construction on a 5-story brick and steel electrical measurements laboratory with 142.00 sq. ft. of floor area, also at Lynn.

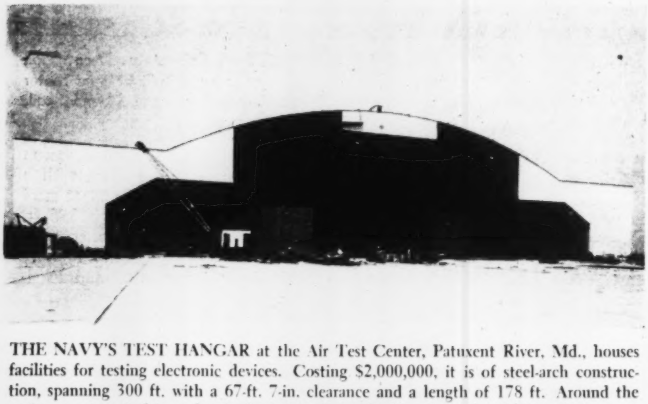
JOHNS-MANVILLE—The fourth building in the research center at Manville, N. J., is nearly completed. It is the Research and Administration Building—three stories high, with a four-story center section, and of steel and brick construction. It is 356 ft. long by 67 ft. 6 in. wide. Other structures at the center are the Product Development, Mechanical and Engineering Buildings.

THE PARAFFINE COMPANIES—Foundation work is under way for a linoleum factory on a 30-acre tract at Metuchen, N. J. Major unit in a

BUICK-OLDSMOBILE-PONTIAC ASSEMBLY PLANT at Framingham, Mass., which started production in Feb., 1948, houses nearly 20½ acres of manufacturing space under one vast roof.



THE AIR FORCE HANGAR at Limestone, Me., of thin-shell concrete, is the same size as the one at Rapid City, S. D., spanning 340 ft. with a 90-ft. clearance. These are the longest span concrete hangars in the U. S.



THE NAVY'S TEST HANGAR at the Air Test Center, Patuxent River, Md., houses facilities for testing electronic devices. Costing $2,000,000, it is of steel-arch construction, spanning 300 ft. with a 67-ft. 7-in. clearance and a length of 178 ft. Around the entire structure is ¼-in. galvanized wire mesh to shield against electric disturbances.

$20,000,000 expansion program, the plant will include a 752-ft. long, steel-frame, protected-metal inclosed warehouse; printing building; power plant; paint factory; festoons, roll storage, mill, oxidizing unit, figuring and scratch buildings; racks, offices, varnish plant and stock-preparation building. Completion is expected in 1950.

PORT OF NEW YORK—During 1948, the Port Authority spent more than $12,000,000 on construction in the New York-New Jersey Port District. Among the larger projects under way are: The $8,100,000 Newark Motor Truck Terminal, 200 x 1,150 ft., for which foundations and steel work are finished; $9,300,000 New York Motor Truck Terminal, 160 x 1,000 ft., which is one-third completed; and the $20,000,000 Bus Terminal in midtown Manhattan, 200 x 800 ft., steel frame, four stories high, for which excavation is under way. Contracts were let in Feb. 1949, for the $4,212,865 twin, steel-arch hangars of 300-ft. span at the New York International Airport.

RAPID CITY AIR BASE—The final roof pour for one of the world's largest long-span, thin-shell concrete hangars is scheduled for April. Completion date for the $1,600,000 structure at the U. S. Air Forces base in South Dakota is set for June 1. Capable of simultaneously servicing two B-36's or six B-29's, the hangar is 314 ft. long, 95 ft. high. A thin-shell concrete arch roof (5in. at crown; 7 in. at springing) gives a 340-ft. clear span, with rigidity provided by external 20-in. x 5-ft. arch ribs on 25-ft. centers.

THE TEXAS COMPANY—Completion by July is expected for the refinery at Westville, N. J. Having a design capacity rating of 40,000 bbl. per day of crude, the plant includes an atmospheric crude topping and vacuum pipe, still, fluid catalytic cracking unit, thermal reformer, catalytic polymerization unit and auxiliaries. Extension of lube oil manufacturing facilities at Port Arthur, Texas, will increase capacity by 37,500 bbl. per day of crude and 2,500 bbl. per day of finished lube oils.

WESTERN ELECTRIC CO.—Started in June, the 1,200,000-sq. ft., steel-frame factory at Indianapolis for manufacture of telephone equipment will be completed in 1951. Among the other large plants the company had under way, a 425,000-sq.ft. electronics factory at Allentown, Pa., was

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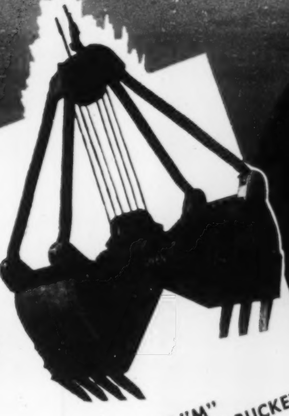

TYPE "M" GENERAL PURPOSE BUCKET

Primarily for excavating but efficient in handling compact materials, large crushed rock, etc. Overloads in loose materials.

Narrow buckets available for trench and cramped excavating.

TYPE "K" STANDARD BUCKETS

For rehandling bulk material. Light but strong. Can be equipped with counterweight jackets, also bottom teeth for certain kinds of digging.

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Built lighter for greater capacity in materials which do not require the weights of the Standard Type "K" for penetration.

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Wider and heavier than corresponding sizes of "K" Buckets. For unloading barges, flat cars, stock pile work, etc. Good for "clean up".

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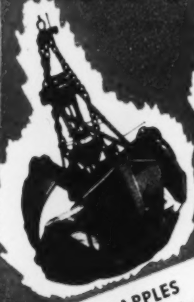
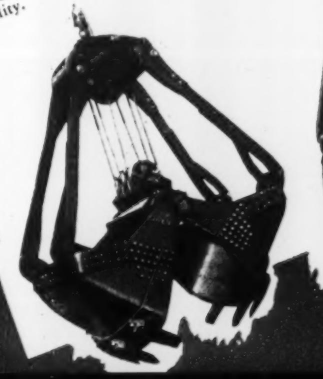


GRAPPLES

of various designs are available for handling stone, scrap iron and pulpwood.



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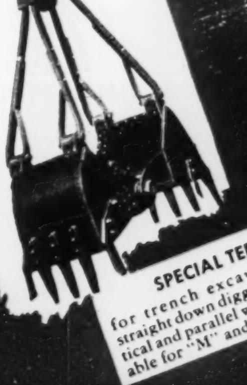
is available on "M", "D" and "DX". Heavy curved lip gives a surface that penetrates more readily and withstands shocks and strains that would bend the lip of a conventional bucket. Strains and impacts are distributed over the entire heavy and continuous lip.



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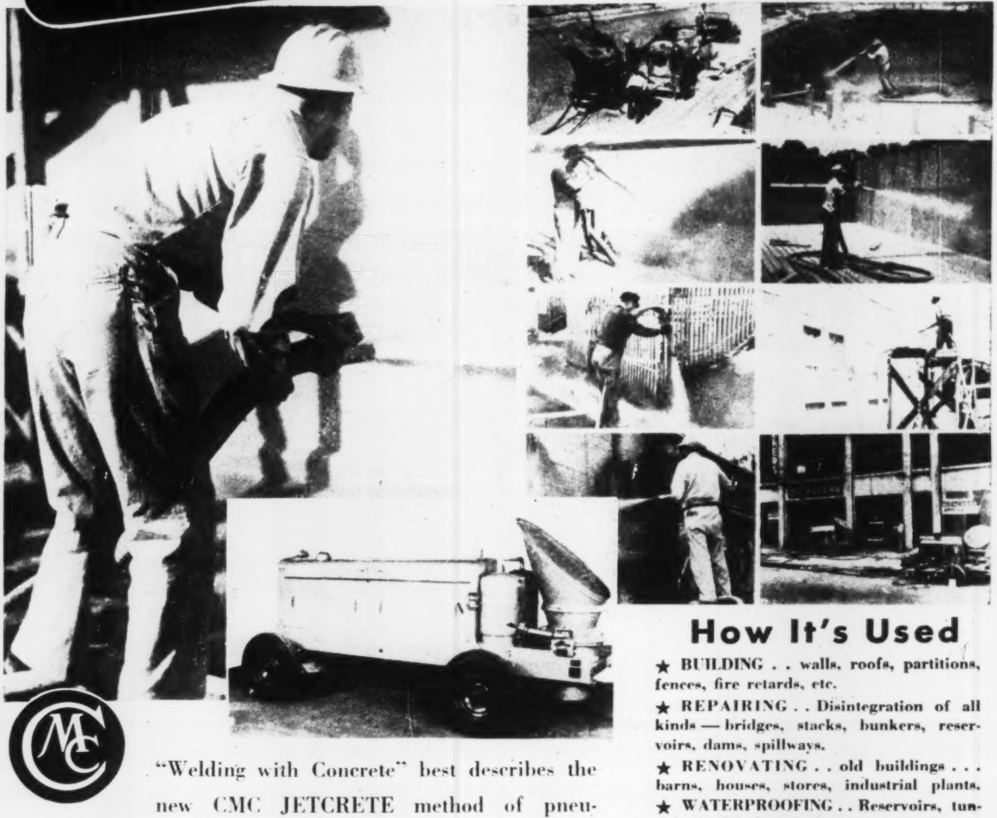

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finished in October, and a 171,000-sq. ft. warehouse and repair shop at Minneapolis will soon be completed.

ESSO BUILDING—This 33-story, T-shaped, air-conditioned skyscraper rises to a height of 424 ft. at the north end of Rockefeller Center in New York City. Completed last spring for the Standard Oil Co. of New Jersey, it contains 350,000 sq. ft. of rentable area. It has a structural steel frame, limestone-faced walls backed with brick, cast aluminum spandrels and reinforced concrete floors.

ILLINOIS INSTITUTE OF TECHNOLOGY—A $675,000 central heating plant will be completed in 1949 under a continuing $20,000,000 program for educational and research facilities that envisions 20 new structures totaling 19,000,000 cu. ft. Construction will start this year on a $600,000 headquarters for research and testing staffs of the Association of American Railroads and on a $750,000 unit for the Institute of Gas Technology. A $10,000,000 housing program for 1,800 dwelling units in 24 buildings is also underway. In 1948, two 4-story dormitories housing 218 students were completed at a cost of $240,000 each ($1.11 per cu. ft.). Scheduled for completion this summer is a 10-story apartment. Construction cost of the 120-unit building will be $1,040,000 ($1.32 per cu. ft.).

MUTUAL LIFE INSURANCE CO. —Excavation has been finished in preparation for an air-conditioned, 25-story, steel-frame home office building in midtown Manhattan, New York City. Having a ground-floor area of 150 x 200 ft., the structure will contain 550,000 sq. ft. of floor.

NEW ENGLAND TELEPHONE & TELEGRAPH CO.—The 22-story main office building in Boston is partly occupied. Covering a ground-floor area of 183 x 185 ft., the structure has a steel frame, with stone concrete fireproofing, and a limestone and granite exterior.

100 PARK AVE.—Excavation is under way for a 36-story, $20,000,000, steel-frame, air-conditioned office building near Grand Central Terminal in New York City. Lower floor areas of 32,000 sq. ft. will be reduced by setbacks at the 9th, 11th, 14th, 15th, 17th and 21st floors to 8,000 sq. ft. in the tower.

TEXAS MEDICAL CENTER—Two structures, constructed of rein-

TERRACE PLAZA BUILDING—20-story, $12,000,000, combined hotel and department store—was completed last July in Cincinnati. Air-conditioned, the structure is windowless from the 2nd to the 8th floor, where it is used for commercial activities. The hotel lobby is on the 8th floor.

GREATEST SINGLE RESIDENTIAL DEVELOPMENT in southern California is the $50,000,000 conversion of 640 acres in Los Angeles' Baldwin Hills. Plans call for 6,000 two and three-story apartment units, 8,000 homes, a large hotel and several 13-story apartment houses. Current phase is 50 acres of 2-story apartment buildings

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forced concrete and Texas shell limestone, have been completed. The $2,500,000 Professional Building, 14-story offices for doctors and dentists, was occupied last month and the 370-bed, $3,500,000 addition to the Hermann Hospital was dedicated this month. Bids will be taken soon for the $6,000,000 University of Texas School of Denistry and M. D. Anderson Hospital for Cancer Research, and funds are expected to be made available this year for the Post-graduate Medical School and the School of Public Health. Construction plans have been made also for a 277-bed, 7-story, $2,500,000 Shrine Children's Hospital, a 5-story, $2,000,000 Tuberculosis Hospital and a Central Outpatient Clinic and Pathological Institute.

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY—Construction of the $2,895,000 Battery Parking Garage for 1,050 cars was started in Sept., 1948, with completion expected in Dec., 1949. Located just north of the Manhattan plaza of the Brooklyn-Battery Tunnel in New York City, the reinforced concrete building covers a 50,000-sq. ft. area and will provide parking space on seven levels including the roof, the ground floor being partly occupied by stores.

UNITED NATIONS HEADQUARTERS—Footings are being cast for the air-conditioned, 42-story, steel-frame, 72 x 300-ft. Secretariat Building on the east side of Manhattan in New York City. A fan-shaped general assembly hall, garages, a 600-seat theater and other structures are still in the blueprint stage. New York City will spend $15,000,000 for improving adjacent areas, including widened access streets.

VETERANS ADMINISTRATION—Part of a billion-dollar program, two hospitals—1,172 beds at Tomah, Wis., and 477 beds at Lebanon, Pa., have been completed—and 31 hospitals are in various stages of construction. Nearly finished: 399 beds at Providence, R. I.; 283 beds at Sioux Falls, S. D.; and 152 beds at Grand Junction, Colo. Completion in 1949: 1,000 beds at Brooklyn, N. Y.; 1,005 beds at Buffalo, N. Y.; 1,965 beds at Peekskill, N. Y.; 200 beds at Altoona, Pa.; 250 beds at Iron Mountain, Mich.; 200 beds at Ft. Wayne, Ind.; 162 beds at Minot, S. D.; 250 beds at Big Spring, Tex.; 450 beds at Shreveeport, La.; and 250 beds at Fresno, Calif. The remainder are expected to be ready in 1950. Planned,

HOME OFFICE of John Hancock Mutual Life Insurance Co. in Boston, 30 stories high, is nearly completed. The air-conditioned edifice, tallest in New England, is of steel-frame construction faced with sandstone, granite and aluminum, is 250 x 270 ft. in plan and contains 1,000,000 sq. ft. of floor.

PRUDENTIAL

WESTERN HOME OFFICE for the Prudential Insurance Co. in Los Angeles, 10 stories high with 517,000 sq. ft. of floor area, officially opened for business in November, is estimated to have cost $8,000,000.

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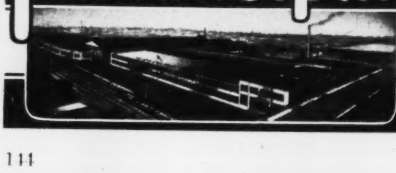

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GLEN OAKS VILLAGE. Second section of 2,532 apartment units is now occupied by more than 700 families. The first section, for 576 families, was finished early last year. Located in Queens, N. Y., the project, with current mortgage commitments of $25,000,000, is the largest FHA building operation underway. (Gross-Morton Co. photo)

but not yet under contract, are 64 more projects.

BOSTON HOUSING—The housing authority had under way an 1,861-unit program, to cost $23,185,000. Of these, 817 one and two-family houses were completed.

FRESH MEADOWS—Scheduled to be finished this summer, this housing project of the New York Life Insurance Co., in Queens, N. Y., will shelter 600 families in two 13-story buildings and 2,400 families in 140 two and three-story houses.

LONG BEACH—Griffith, Walker and Lee plan expenditure of $36,000,000 in the Lakewood district, where 1,500 homes have been built to date.

HANCOCK VILLAGE—The 789-family housing project of the John Hancock Mutual Life Insurance Co. in the Brookline-West Roxbury, Mass., area is fully occupied. When completed this summer, the development will include three large 2 and 3-story, concrete-frame garages and a shopping center, in addition to the basementless, radiant-heated, 2-story, brick and cinder-concrete houses.

METROPOLITAN LIFE—In **New York City**, Stuyvesant Town's 35 twelve and thirteen-story apartment buildings will be completed this Spring and will house 8,755 families. The 21 fifteen-story buildings, for 2,495 families, in Peter Cooper Village, will all be finished this year, with only five left to be completed. And the seven 13-story buildings, with 1,232 apartments, in Riverton were completed last Spring. In **Los Angeles**, foundations are being cast to add 2,754 apartments to the 1,314 that were built at Parklabrea during the war. Several blocks of 2-story houses and 18 thirteen-story buildings are planned, with completion scheduled for 1950. In **San Francisco**, construction is in a similar stage at Parkmerced, where 1,816 apartments in 11 thirteen-story buildings will be added to the 1,687 apartments completed during the war.

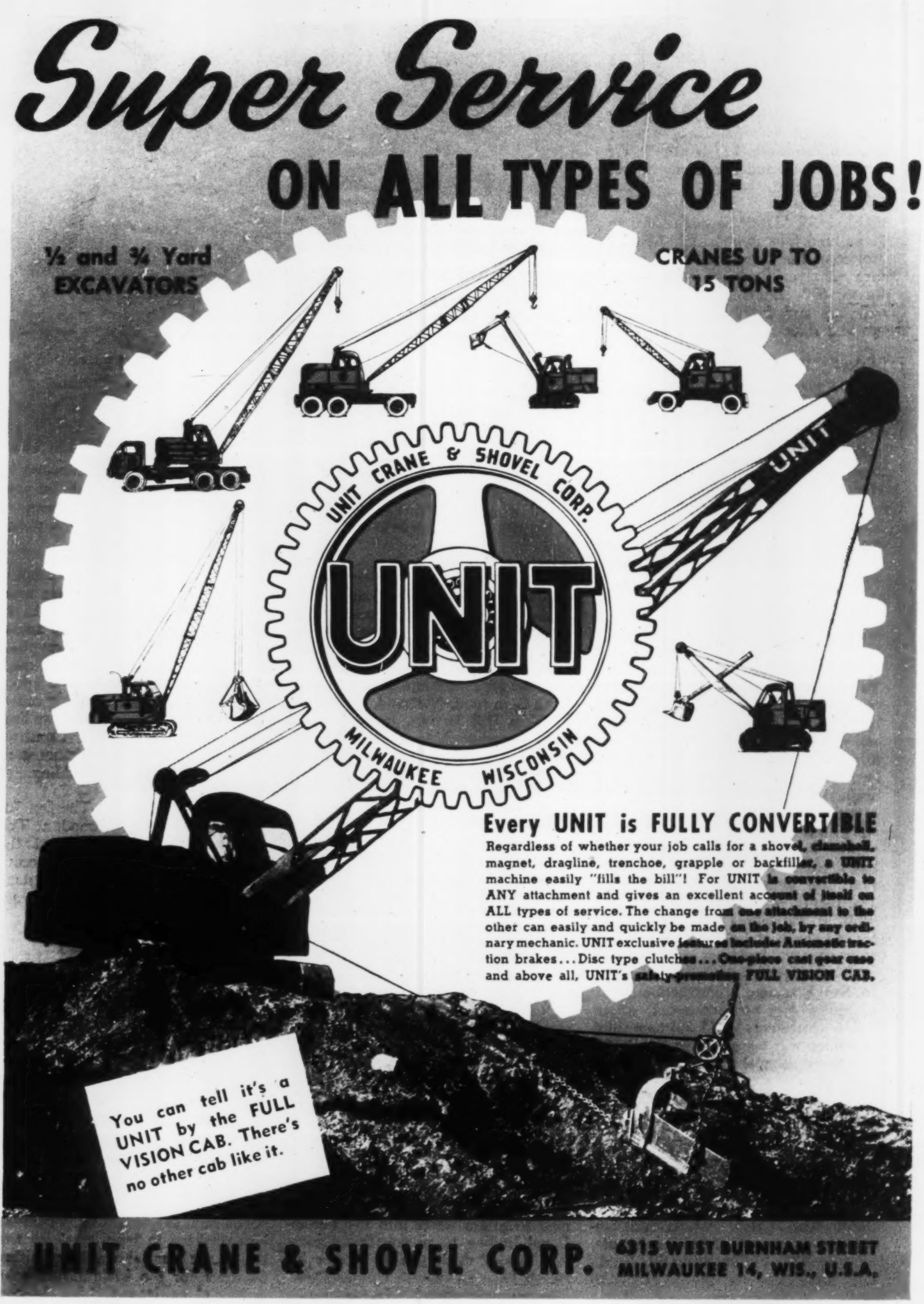
NEW YORK CITY HOUSING—The authority completed in 1948: Brownsville, J. W. Johnson, Abraham Lincoln, Amsterdam, Marcy and Jacob Riis (Federal) projects to house 7,925 families at a construction cost of $59,543,907. Partly occupied: Jacob Riis (City), Astoria and Gowanus projects with 2,821 apartments, costing $27,313,706 to build. Bricks are being laid for the $14,080,186 Lillian Wald development for 1,861 families. Started in 1948 and now in the foundation stage: Woodside, South Beach, Pelham Parkway, Eastchester, Gov. Smith, Todt Hill, Albany, Glenwood, Nostrand, Sheepshead Bay, Dyckman, Gun Hill, Bronx River and Patterson for 15,524 families. Exclusive of the Glenwood, Nostrand, Dyckman and Gun Hill Houses, for which all bids have not yet been taken, construction cost for these is $108,845,865. The Lincoln and Smith Houses have structural steel frames, all others reinforced concrete.

PARK FOREST—Over 250 rental dwelling units were completed in 1948 and 2,500 more should be finished during 1949 under American Community Builders' plan for developing 2,400 acres into a new suburban town for 30,000 persons 27 mi. south of Chicago. Construction of 4,000 houses for sale will follow the first-phase $30,000,000 rental program. A 1-mgd. water-softening plant will be in operation this spring and a shopping center is now underway. Rental dwellings are duplex with basement. Construction is wood frame with brick, or stone veneer, or wood or asbestos siding.

PUEBLO GARDENS—The first 700 houses, built of precut wood, at Tucson, Ariz., will be completed this Spring by Del E. Webb. The second 500 units are in the planning stage. Ultimately there will be 3,000 homes.

WATER USE AND CONTROL

COLUMBIA RIVER BASIN – The major undertaking in the Columbia River Basin is the **Columbia Basin Irrigation Project**, which is estimated to cost $600,000,000 and will supply irrigation water to one million acres in a loop of the river south of Grand Coulee Dam (see map on p. 147). In October, 1948, a contract was let by the Bureau of Reclamation for completion of the pumping plant that will use power generated at the dam to raise irrigation water into the **Feeder Canal** leading to an equalizing reservoir formed in the Grand Coulee by **North Dam** and **South Coulee Dam**. The pumping plant will be the world's largest, containing ultimately twelve 65,000-hp. centrifugal pumps with a capacity of 1,350 cfs. each, operating against a head of 310 ft. Contracts for six pumps and motors were let in 1946 and the first will be in operation by the end of 1951. All work on the **Feeder Canal** will be under contract by spring. Bids have been called for **North Dam**; work on **South Dam** is underway. The **Main Canal** above Long Lake is completed, except for **Bacon** tunnel and siphon, which will be completed in June, at which time **Long Lake Dam** also will be finished. Contract for the **Main Canal** below that point was let in October, for com-



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pletion in 1950. About 6½ miles of the **West Canal** will be completed in June; a second 14-mile section will be put under contract in the spring, and a third section 14.5 miles long will start in September. A $7,615,000 contract for **Soap Lake** siphon was let in December. The first section of the **East Low Canal**, 12 miles, will be completed in June; contracts for the remaining sections will be let this year. **O'Sullivan Dam** (formerly Potholes Dam) will be completed in July, and bids for a 7-mile section of **Potholes East Canal** are to be called in the spring.

Expansion of the power plants at **Grand Coulee Dam** is continuing. The nine 108,000 kw. units in the left power house are in operation and all of the 9 units for the right plant are under contract, the first three being scheduled for operation for April 15, July 15 and Oct. 15, respectively.

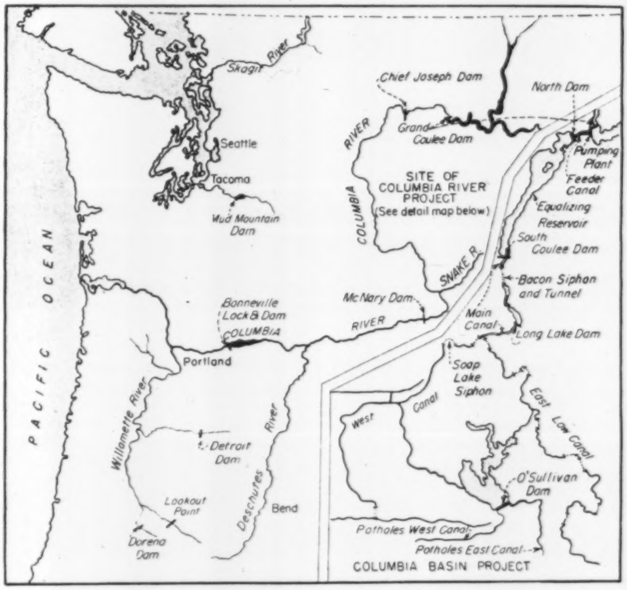
Anderson Ranch Dam on the South Fork of the Boise River in Idaho (not shown on the map) is complete except for the spillway. The world's highest earthfill, it is 456 ft. high and 1,350 ft. long at the crest. Work on the two 15,000 kva. generators in the power plant will be completed this year.

Work is to start this year on another project in Idaho–**Palisades Dam** on the Snake River 65 miles east of Idaho Falls. It is to be an earthfill 260 ft. high and 2,300 ft. long for power, flood control and supplementary irrigation. Initial power installation will be two 20,000-kva generators.

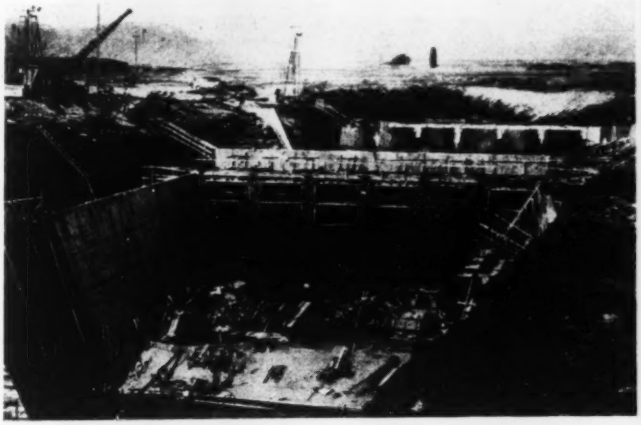
Construction of **Hungry Horse Dam** on the South Fork of the Flathead River in Montana (not shown on the map) was begun in June, 1948. It is a concrete arch 530 ft. high for power flood control and future irrigation supply. Four 75,000-kva. generators are under contract for operation in June, 1952.

These four projects are being built by the Bureau of Reclamation.

Construction on the biggest job of the Corps of Engineers on the Columbia, **McNary Dam**, moved into high gear in 1948 with the awarding of a $21,000,000 contract for construction of the 86x675-ft. navigation lock and part of the main dam. To cost almost $300 million, this project will include 980,000 kw. of generating capacity, with first power delivery expected in 1954. Construction of the $205 million **Chief Joseph Dam** on the Columbia just below **Grand Coulee Dam** by the Corps of Engineers has been authorized, also the $86,000,000 **Ice Harbor Dam** and lock on the Snake River, but no appropriation has been made.

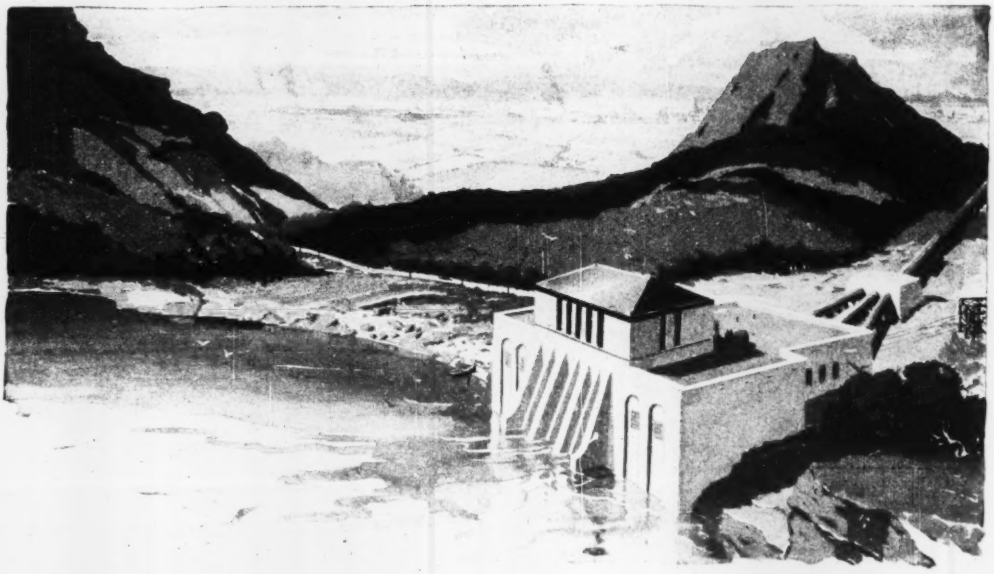

Skagit River
Chief Joseph Dam
North Dam
Seattle
Tacoma
Mud Mountain Dam
RIVER
Grand Coulee Dam
Pumping Plant
Feeder Canal
SITE OF COLUMBIA RIVER PROJECT (See detail map below)
COLUMBIA
Equalizing Reservoir
South Coulee Dam
SNAKE R.
Bacon Siphon and Tunnel
PACIFIC OCEAN
Bonneville Lock & Dam
COLUMBIA
McNary Dam
RIVER
Main Canal
Long Lake Dam
Portland
Soap Lake Siphon
West Canal
East Low Canal
Willamette River
Detroit Dam
River
Deschutes
O'Sullivan Dam
Lookout Point
Bend
Dorena Dam
Potholes West Canal
Potholes East Canal
COLUMBIA BASIN PROJECT

IN THE PACIFIC NORTHWEST several large dams are under construction on the Columbia and its tributaries. Largest irrigation work is the Columbia Basin project.



HEADWORKS for the Main Canal of the Columbia Basin irrigation project. This structure will control the flow from South Coulee Dam.

On the Willamette River and its tributaries good progress was made on three flood control, navigation and power projects. Preliminary phases of construction at the **Detroit Dam** on the North Santiam River are about completed. Bids on the main structure were opened late in February. Estimated total cost of this dam, including powerhouse and re-regulating reservoir, is $65,000,000. **Dorena Dam** on Row River was 75 percent completed at the year's end and will be finished in November 1949. Relocation of the Lost Creek section of the Southern Pacific R.R. is under way, at a cost of more than $2,000,000, preparatory to construction of **Lookout**



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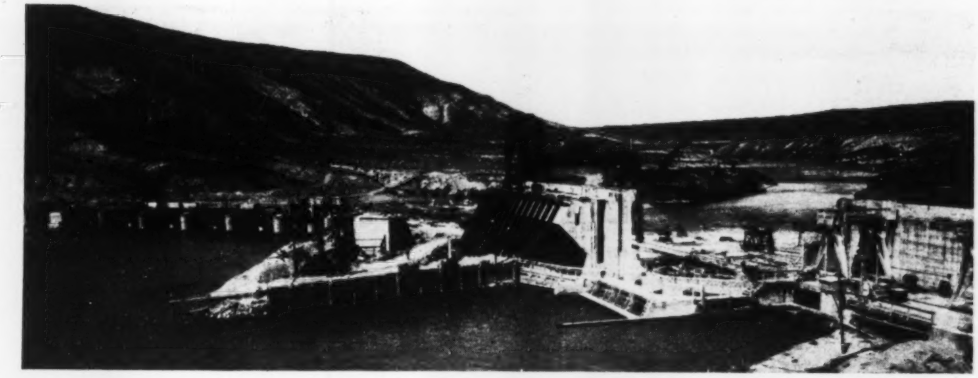

LOWER SALMON DAM on the Snake River in Idaho is being built by the Idaho Power Co. to add 60,000 kw. to the power supply of the region. The dam and power plant now are practically completed and will be in production soon.

Point Dam on the Middle Fork Willamette, at a cost of $51,000,000, for completion in 1951.

A $50,000,000 hydroelectric development of the Idaho Power Co. on the Snake River in southern Idaho will provide 150,000 kw. generating capacity. Included are the **Lower Salmon Dam**, a 100,000 cu. yd. gravity structure; a similar structure near **Bliss**, Idaho; and other smaller installations. (69,000 kw.) will be completed early in 1950.

CENTRAL VALLEY PROJECT—Work on the Central Valley Project of the Bureau of Reclamation in California during 1948 was centered on the canals, of which there will be 350 miles, the pumping plants and power distribution lines. About 26 miles of the 117-mile **Delta-Mendota Canal** is completed and an additional 29 miles is under contract, as is the **Tracy** pumping plant of 4,600 cfs. capacity. Studies are being made for the **Delta Cross Channel** and bids for the five 1,520-cfs. pumps for that channel will be called in July. The first 70 miles of the **Friant-Kern Canal** will be completed this spring. The 47-mile **Contra Costa Canal** is completed and transmission lines to the pumping plants are being built. **Keswick Dam** and power plant are scheduled for completion in 1950.

The Corps of Engineers has preliminary work under way at three multiple-purpose projects in California's Central Valley. They are **Folsom Dam** on the American River, **Pine Flat Dam** on the Kings River and **Isabella Dam** on the Kern River.

POWER FOR CALIFORNIA—The Pacific Gas and Electric Co.'s major hydro-electric unit completed in 1948 was the 99,000-kva. **Electra** project on the Mokelumne River. Under way on the Feather River are the 75,000-kva. **Cresta Dam** and power plant, scheduled for completion in June, 1949, and the 126,000-kva. **Rock Creek Dam** and power plant to be on the line early in 1950. Several major steam plants are also involved in the expansion required by the lack of wartime construction and the phenomenal postwar population and industrial growth.

A NEW TREND in hydro power plant design is exemplified by the outdoor-type station of the Lower Malad plant of the Idaho Power Co. in southeast Idaho.

FLOOD CONTROL work by the Army Engineers in the Los Angeles County drainage area, estimated ultimately to cost $361 million, continues with some $30,000,000 being currently spent on channel improvements in the Los Angeles River and elsewhere. Land acquisition has started for the **Whittier Narrows** project, a $50,000,000 flood control works with a drainage area of more than 550 sq. mi. on the San Gabriel and Hondo rivers.

COLORADO RIVER BASIN—Construction work is well along on **Granby Dam** at the headwaters of the Colorado River in Colorado and the four dikes that will form the main reservoir for storage of flood waters to be diverted under the Continental Divide as part of the **Colorado-Big Thompson** power and irrigation project of the Bureau of Reclamation. The Granby pumping plant is 60 percent complete and work on the uncompleted section of the 2.1-mile **Granby Pump Canal** will start in the spring. **Adams Tunnel** under the divide is completed. On the east slope, **Spring Canyon Dam** was completed in September, and the three other earth-fill dams—**Horsetooth, Dixon Canyon** and **Soldier Canyon**—that are to form **Horsetooth** reservoir will be completed this coming summer. The **Marys Lake** and **Estes Park** power plants will be completed in 1951. **Olympus Dam** is nearing completion.

At **Hoover Dam**, contracts were let recently for two additional generators of 82,500-kva capacity, which are to be in operation by May, 1952. They will bring the capacity of the plant up to 1,199,800 kva. Space for only two more generators remain in the plant.

Diversion of the Colorado River at **Davis Dam**, 67 miles below Hoover Dam, was begun during 1948 upon

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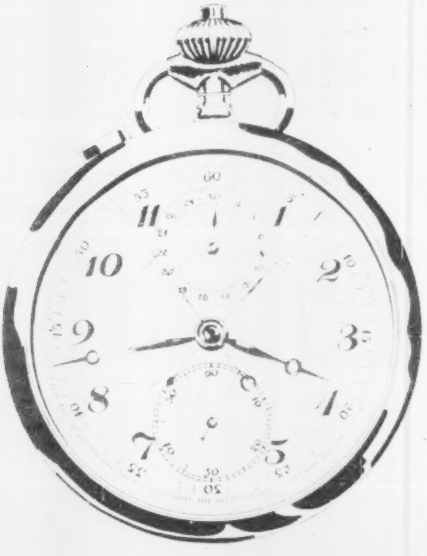

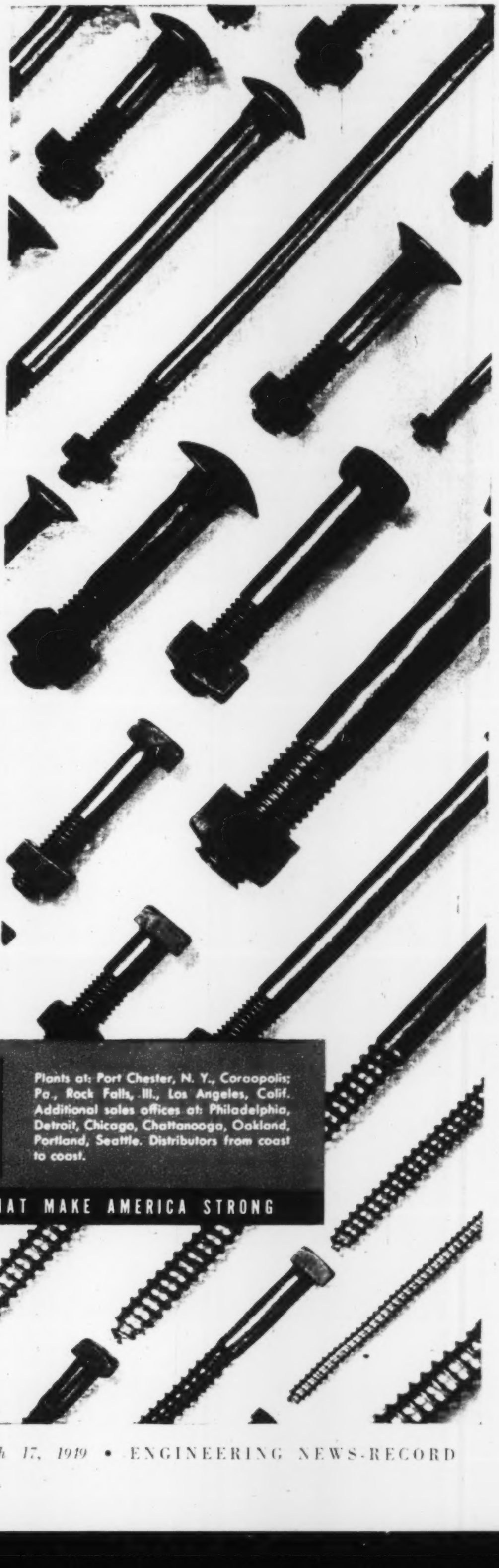

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ROCK CREEK DAM on the Feather River in California will supply the largest hydro plant in the Pacific Gas & Electric Co. expansion program.

completion of the diversion channel. Subsequently the site of the dam was unwatered and placing of the impervious fill was begun. The dam is to be an earth and rock-fill structure 138 ft. high and 1,600 ft. long. It will be completed in October, when work will start on the power plant to accommodate five 45,000 kw. generators. Davis Dam is for regulation of the flow of the river below Hoover Dam as required by the water treaty with Mexico signed in 1944.

On the **Gila** irrigation project in Arizona, work on the 18-mile **Wellton-Mohawk** canal and its three pumping plants has begun. This extension of the project is expected to be completed in 1952.

These four projects on the Colorado and its tributaries are being built by the **Bureau of Reclamation**.

Across the Colorado River in the reach where it forms the boundary between United States and Mexico, the Mexican government has begun construction of the **Morelos** diversion dam authorized by the 1944 treaty. It is a low structure of the floating type 1,400 ft. long, 602 ft. of which is an open spillway and 702 ft. is controlled by gates. Construction began in September and is now 21 percent complete, with July 1950 set as completion date.

PROVO RIVER, UTAH—Work is now in progress on the last section (7.8 miles) of the 41-mile aqueduct to bring water from **Deer Creek** reservoir in the Provo River to Salt Lake City. Also under construction is the **Duchesne** tunnel and **Murdock** diversion dam. **Jordan Narrows** pumping plant and siphon will be completed this summer.

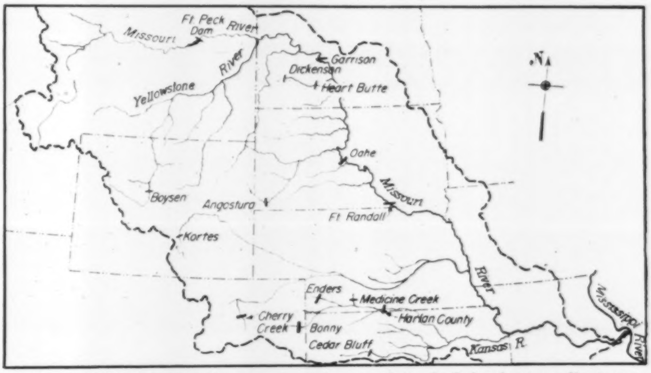
MISSOURI RIVER BASIN—Flood control and river development work continues to expand under the multibillion dollar Pick-Sloan plan—a joint program of the Army's Corps of Engineers and the Bureau of Reclamation. Three major earth dams are under construction by the Corps of Engineers on the Missouri River main stream in the Dakotas. At the $160,000,000 **Ft. Randall Dam** (160 ft. high, 10,000 ft. long, 30,000,000 cu. yd. embankment), near the Nebraska border, 11,000,000 cu. yd. were moved during 1948 to complete a $4,500,000 contract for first-stage embankment. Work is now starting on an 8,000,000-cu. yd. $4,198,000 second-stage job. For the outlet works, the driving of 12 tunnels ($8,600,000) and construction of the downstream portions ($11,000,000) has been contracted for, with work scheduled to start this spring. A low bid of $11,839,517 has been received for the upstream section. Pickstown, construction town for 3,500 at the damsite, is 50 percent complete.

Oahe Dam 6 miles above Pierre, S. D., got underway with awards of $670,000 for temporary housing and a 4-mile access highway. The dam will have a 9,300-ft. crest, a maximum height of 242 ft., and will require 78,000,000 cu. yd. of fill. The first of the earthmoving contracts for the $181,000,000 project will be let this year.

On the $188,000,000 **Garrison Dam**, 75 mi. above Bismarck, N. D., 7,000,000 cu. yd. of earth have been moved on the $6,350,000 contract for Stage 1 embankment, and a $13,600,000 contract has been let for Stage 2, involving 20,000,000 cu. yd. of excavation and 17,000,000 of embankment. A total of 69,000,000 cu. yd. will be required for the dam, which is to be 12,000 ft. long and 210 ft. high. It will store 23,000,000 acre-ft. Contracts totaling $10,000,000 have been let for the construction town, Riverdale. New contracts totaling $64,000,000 are planned for 1949 letting, including outlet tunnels and powerhouse foundations.

Near Denver, the $19,000,000 **Cherry Creek Dam** is 65 percent complete with over $10,000,000 in contracts in force, under supervision of the Corps of Engineers. Half of the 15,000,000-cu. yd. rolled-earth embankment has been placed; the balance will be finished this year. Project completion date is June 1950.

At **Harlan County Dam** (106 ft.



ON THE MISSOURI RIVER three large dams are being built by the Army Engineers, chiefly for flood control. They also are building storage dams on lower tributaries. At the headwaters the Bureau of Reclamation is building irrigation dams.

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high; 12,000 ft. long; 13,000,000 cu. yd. embankment) on the Republican River in Nebraska, 4,300,000 cu. yd. have been excavated and 3,200,000 yd. of earth fill placed. Contracts to date total $35,000,000 including 10 miles of railroad relocation. A further contract to relocate 20 miles of Burlington R.R. trackage will be let this year. Completion of the $41,000,000 project is scheduled for 1952.

A second power unit was installed at **Ft. Peck Dam** in 1948 and a third is under way. Present capacity is 50,000 kw. of an ultimate 105,000 kw.

Flood protection work on the lower Missouri at **Kansas City** is 40 percent complete. A flood wall has been completed on the Missouri side and $2,600,000 in contracts are in force for levees in Kansas. For the latter, a 1,742-ft. concrete floodwall has been finished and 1,500,000 yd. of fill placed for a 15-ft. levee whose completion is forecast for July. Additional levee and floodwall work is to be done this year in Kansas. Downstream, the $2,500,000 **Liberty Bend Cutoff** to shorten the Missouri is virtually complete. An 1,883-ft. high-level bridge to carry U. S. Route 71 over the new channel is already open to traffic, and the river cutoff will be in operation this spring.

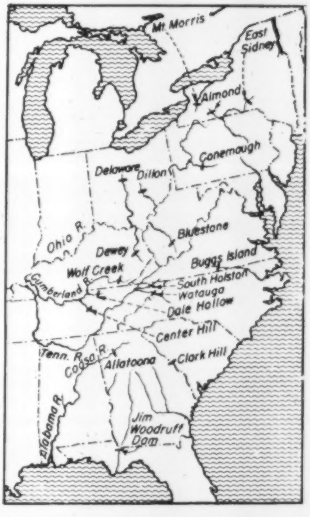
The Bureau of Reclamation has the following large projects underway in the upper part of the Missouri River valley: **Boysen Dam** and power plant, an earth and rock-fill 150 ft. high and 1,100 ft. long on the Big Horn River in Wyoming—work began late in 1947 and is scheduled for completion in 1952. Included is a 15,000 kva. power plant and relocation of 14 miles of railway. Also in Wyoming is **Kortes Dam**, a concrete structure 200 ft. high and 400 ft. long, and a power plant of three 12,000 kw. units. Work on the dam and power station is 60 percent complete. **Angostura Dam** on the Cheyenne River below the Wyoming-South Dakota border is to irrigate 16,000 acres. It is a concrete dam 160 ft. high flanked by an earth abutment, a total length of 1,900 ft. About 70 percent of the concrete has been placed. Completion date is July, 1950.

In North Dakota both **Heart Butte Dam** and **Dickinson Dam** are under construction on the Heart River. They are earth fills, 1,850 ft. and 2,275 ft. long and 135 and 50 ft. high. Dickenson Dam was first started in December. Heart Butte will be completed in 1951.

Bonny Dam on the South Fork of the Republican River in Colorado, an earthfill 9,300 ft. long and 130 ft. high, was started in December; **Enders Dam** on Frenchman Creek in Nebraska, an earthfill 2,570 ft. long and 100 ft. high, is well under way, with completion scheduled for the fall, and **Medicine Creek Dam**, also in Nebraska, 4,000 ft. long and 102 ft. high, is one third complete.

EXCAVATING for the tailrace and stilling basin below Fort Randall Dam on the Missouri River in South Dakota.

MISSISSIPPI LEVEES – Enlargement and construction of 277 miles of levees on the Mississippi River between Wood River and Gale, Ill., is being carried out by the Corps of Engineers. The work involves placement of 99,000,000 cu. yd. of earth. At present 28 contracts, which involve $6,500,000, are under way. In 1948, 9,330,000 cu. yd. were placed, and 3,250,000 cu. yd. remain to be placed under these contracts. Specifications for 17 more contracts for handling 8,953,000 cu. yd. are being prepared for bids this year. Included in the project is a low-water overflow dam in the Wood River diversion channel near Alton, Ill. costing $798,000, which is 80 percent complete.



DAMS ON OHIO TRIBUTARIES and rivers of the southeastern states are primarily for flood control with some power and regulatory storage.

CHAIN OF ROCKS CANAL—All of the excavation has been completed for two parallel navigation locks (1,200 x 110 ft. and 600 x 110 ft.) at the south end of an 8-mile canal on the Illinois side of the Mississippi river near St. Louis to bypass the hazardous **Chain of Rocks** reach. Over 10 percent of the 400,000 cu. yd. of concrete for the $16,000,000 locks has been placed, with completion scheduled for late 1950. A $1,500,000 high-level bridge to carry U. S. Route 66 over the canal was finished late in 1948. Bids for the first part of the construction of canal and levees above the locks will be taken this spring. The canal will have a 300-ft. bottom width, 1 on 3 side slopes, an average depth of cut of 35 ft., and will involve 23,000,000 cu. yd. of excavation.

ILLINOIS RIVER—The outlet works were completed in 1948 for the $1,560,000 **Fondulac Dam**, a unit of the $10,000,000 **Farm Creek** project to prevent flooding of East Peoria, Ill., being built by the Army Engineers. About 90 percent of the rolled-earth embankment has been placed, spillway concreting will start this spring. Farm

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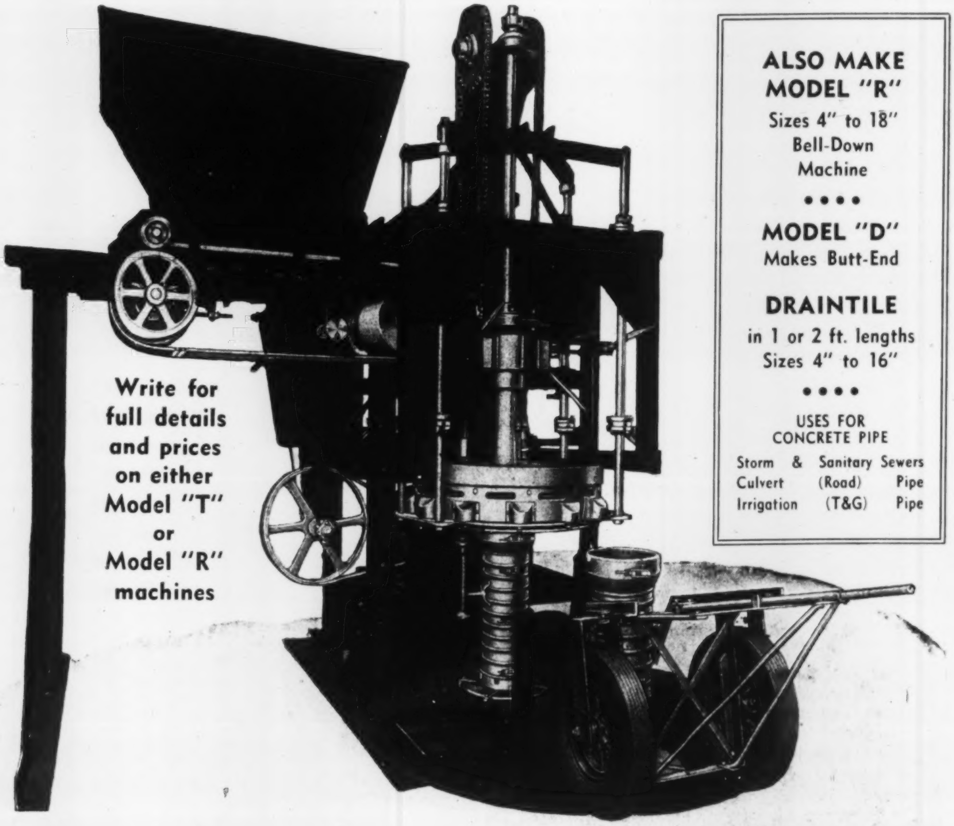

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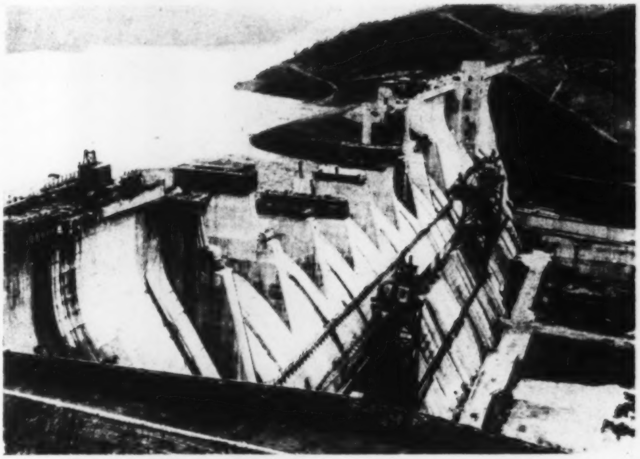
Sioux City (19), Iowa, U.S.A.

Creek's $2,000,000 **Farmdale Dam** will be advertised in May. It will be a 1,275-ft. rolled fill 80 ft. high. A $1,900,000 contract has already been let for relocation of 4½ miles of the Toledo, Peoria & Western R.R. main line around the reservoir.

OHIO RIVER VALLEY – Contracts totaling $59,000,000 were awarded last year by the Corps of Engineers for river and harbor, and flood control projects in the Ohio River Division. Nine projects were completed at a cost of $24,000,000, while an estimated $58,100,000 worth of work on 30 projects is expected to be placed under contract this year. For the 274,000 acre-ft., $44,500,000 **Conemaugh Reservoir** on the Conemaugh River above Pittsburgh, Pa., grading, tunnel work and bridge substructure for relocation of 16 miles of the Pennsylvania R.R. was practically complete at the end of 1948 at a cost of $8,550,000. Bridge superstructures and track work are more than half complete. Contract for the dam proper is to be let soon. The 631,000 acre-ft., $29,900,000 **Bluestone Reservoir** on the New River in W. Va., was 80 percent completed, while the dam, itself, was entirely completed. Other major reservoirs, together with their percentages of completion are: **Delaware Reservoir**, Ohio, 72 percent; **Dewey Reservoir, Ky.**, 60 percent and the **Dillon Reservoir**, Ohio, 37 percent. The $23,200,000 flood wall and levee project at **Louisville**, Ky. was nearly one-fourth completed at the end of 1948.

On the Cumberland River, **Wolf Creek Reservoir** in Kentucky estimated to cost $76,600,000 and to provide 6,089,000 acre-ft. of storage and ultimately 270,000 kw. in power was 39 percent completed. Closure of the dam for the $43,340,000 **Center Hill Reservoir** in Tennessee had been made and the entire project, designed to store 2,092,000 acre-ft. of water and to generate 135,000 kw. of electric power, was 64 percent completed. **Dale Hollow Reservoir**, estimated to cost $24,270,000 and provide 2,092,000 acre-ft. of storage and 36,000 kw. of power is reported to be 95 percent completed.

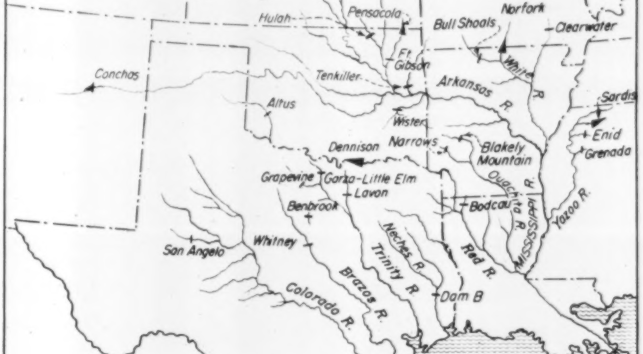
A $6,343,700 contract was awarded last September by the Corps of Engineers for construction of the **Morgantown** lock and dam on the Monongahela River in West Virginia, which will replace two old locks and dams completed in 1903. Work has just started on a $7,263,000 contract in connection with reconstruction of **Locks 2** near Pittsburgh, Pa. It involves the construction of a 56x360-ft. river chamber in the new locks, and demolition of two 43-year old locks. Contracts for a 110x720-ft. land chamber in the project are expected to be let early next year.


STORAGE OF WATER behind Center Hill Dam was begun in December, before the dam was completed, to cut down a flood crest in the Cumberland River.

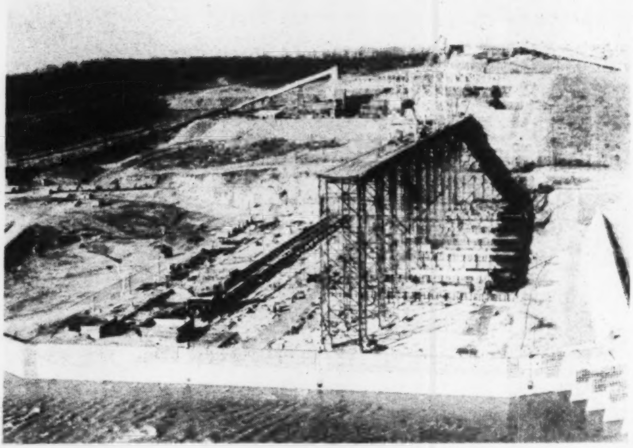
YAZOO RIVER BASIN – A $5,430,000 contract for the 85-ft. rolled-fill embankment, and concrete spillway for **Fndi Dam**, on the Yacoma River, is 40 percent completed. A $9,100,000 contract for the 80-ft. rolled-fill embankment and concrete spillway for the **Grenada Dam**, on the Yalobusha River is 44 percent completed. Contracts are expected to be let this year for river closure, outlet works and reservoir clearing for both flood-control projects.

RED RIVER BASIN – **Altus Dam** of the W. C. Austin project being built by the Bureau of Reclamation on a tributary of the **Red River** in Oklahoma will be entirely completed this year, as will the canals and laterals of the irrigation system.

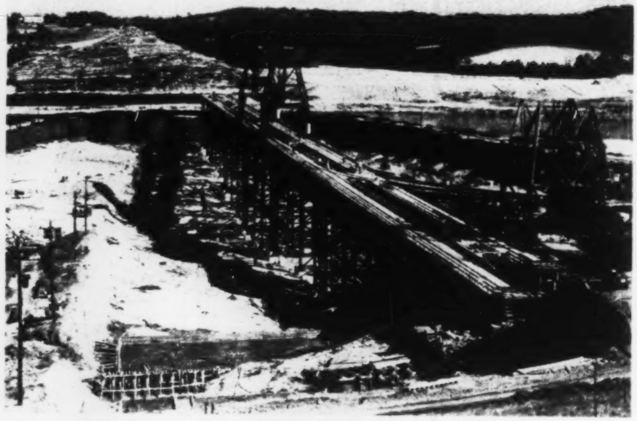
ARKANSAS RIVER BASIN – Embankment work on **Tenkiller Ferry Dam** is 83 percent complete and a contract of $3,600,000 for spillway and outletwork has just been let by



MANY RESERVOIRS for storage of flood waters are being built in Texas and on tributaries of the lower Mississippi River.



A CONCRETE COFFERDAM is being used at Bull Shoals Dam in Arkansas to keep the White River out of the working area.



CLARK HILL DAM in Georgia is being built to store flood waters and to improve navigation on the lower river as well as for power development.

the Corps of Engineers. This is a combined flood-control, power and water supply project in northeastern Oklahoma estimated to cost $23,000,000 and scheduled for completion in 1953. **Wister Dam**, also in eastern Oklahoma on a tributary of the Arkansas, a rolled-fill structure, is scheduled for completion this year. It already has been used to impound part of the flood caused by a 7-in. rainfall.

Fort Gibson Dam on the Grand River, largest dam in the Arkansas Basin, is 73 percent complete. It is a concrete structure for flood control, power and water supply. Contracts totaling about $5,000,000 for highway and railroad relocation, and reservoir clearing, will be let this year. Completion is scheduled for late 1951 or early 1952. **Hulah Dam**, on a headwater tributary, is a 4,730-ft. rolled-fill, with a 472-ft. concrete spillway. A $5,100,000 contract for completion of the dam is 18 percent completed, with about $1,100,000 worth of reservoir clearing and highway relocation to be let this year. The completion date is late 1950. Reservoir clearing has just been started back of the 2,920-ft. rolled-filled **Heyburn Dam**, while the dam itself, is 40 percent completed. **Fall River Dam**, on a tributary of the Verdigris River, will be completed early this year. It is a flood-control structure, with 5,545-ft. of rolled-filled and 470-ft. of concrete spillway.

OUACHITA RIVER SYSTEM — Two flood-control and power dams are being built by the Corps of Engineers on tributaries of the Ouachita River in the lower Mississippi River basin. A $6,680,000 contract for **Narrows Dam**, a concrete structure 185 ft. high, is 40 percent complete. Additional contracts totaling $1,400,000 for two 9,444 kva. generators and a reservoir clearing contract will be let this year, with completion scheduled for February, 1950. Two diversion tunnels for **Blakely Mountain Dam**, a rolled-fill near Hot Springs, Ark., are 35 percent completed, under a $4,470,000 contract. Contracts for the main embankment and outlet structures, estimated to cost $17,000,000, will be let this fall.

WHITE RIVER BASIN—Work on the entire $76,300,000 **Bull Shoals** flood-control and hydro project on the White River in Arkansas was 22 percent complete Feb. 1, and the $22,500,000 dam contract was 30 percent complete. The dam will be finished in the fall of 1950. Power house construction, estimated to cost $4,000,000, will not start until May, 1950, and will be completed two years later.

TEXAS FLOOD CONTROL—In Texas, among the dams now under construction by the Corps of Engineers are four on the Trinity River for flood control. They are **Benbrook Dam** (16,520,000) near Fort Worth; **Grapevine Dam** ($16,564,000); **Lavon Dam** ($16,380,000); and **Garza-Little Elm Dam** ($26,644,900) near Dallas. The Benbrook, Lavon, and Grapevine projects are scheduled for completion in 1951. Construction of Garza-Little Elm Dam is just getting under way and will be completed in 1953.

In the Neches-Angelina river basin, work has been started on one of four authorized flood-control dams, **Dam "B"** ($6,500,000) near Jasper. It will be completed in 1951. Construction of **San Angelo Dam** ($18,525,000) near San Angelo in the Colorado River basin is under way, with completion set for 1952.

In the Brazo River basin the $41,794,000 **Whitney Dam** for flood-control and power is expected to be completed in 1952. It is a concrete dam 167 ft. high flanked by earth fills having a total length of 19,600 ft. Two 15,000-kw. generators will be installed in the power plant.

SOUTH EASTERN STATES—**Jim Woodruff Dam** is being built by the Army Engineers on the Georgia-Florida border at the point where the Chattahooche and Flint rivers join to form the Apalachicola River. It is for power and navigation. The main dam is of concrete flanked by a navigation lock and long earth fill on one side and a powerhouse on the other, the latter to accommodate three 10,000-kw. units. The overflow dam is 79 percent complete. Bids on the lock and fixed-crest spillway will be called this spring. Construction is expected to take five years and cost $42,000,000.

Allatoona Dam, the initial project for development of the Alabama-Coosa River system, is for flood protection at Rome, Ga., and to increase the low flow of the Coosa River for power. It is a concrete structure, 200 ft. high and 1,250 ft. long, with a powerhouse containing two 36,000 kw. generators. Work started in 1946 under a $13,282,000 contract and was 65 percent complete at the end of 1948.

On the Savannah River 22 miles from Augusta, Ga., the Corps of Engineers has started work on **Clark Hill Dam**, a power, flood-control and navigation supply project. The main dam will be 200 ft. high, requiring 1,000,000 cu. yd. of concrete. It will be flanked by long earth fills. The power house will contain ultimately seven 40,000 kw. generators. Embankments are completed. About 15 percent of the main dam is up, under a $26,456,000 contract, which does not include the power plant.

In the Roanoke River valley in Virginia the Corps is building **Buggs Island Dam**, a $78,400,000 project for flood control, navigation and power. The main structure will be of concrete 144 ft. high and 2,785 ft. long flanked by 19,600 ft. of rolled fill. A $13,363,000 contract for the concrete dam and powerhouse was let last April and concrete placing will start this spring with completion set for late in 1951.

TENNESSEE VALLEY—**Watauga Dam** on the Watauga River, a tributary of the Tennessee, a 318-ft. high earth and rock fill was substantially completed by the Tennessee Valley Authority at the end of the year. Two 25,000-kw. generators being installed in the powerplant will be in operation this summer. **Wilbur Dam** below Wautauga is being rehabilitated and a 7,000-kw. unit added.

AT SUNBURY, PA., over 12,000 ft. of concrete flood wall is being built to keep the Susquehanna River out of the city.

Work on **South Holston Dam** on the same river system, which was suspended after the war, was resumed in 1948. It is an earth and rock-fill structure scheduled for completion in 1950. One 35,000 kw. unit will be installed.

The Tennessee Valley Authority is installing eleven additional hydro units in existing plants, totaling 320,000 kw. Four of these units are already on the line.

SUSQUEHANNA BASIN—At the headwaters of the Susquehanna River two flood-control reservoirs are under construction by the Corps of Engineers. **East Sidney Reservoir** on Ouleout Creek near East Sidney, N. Y., made up of 750 ft. of concrete dam 128 ft. high and 1,250 ft. of rolled embankment, begun in 1947, is 52 percent complete. It will cost $6,900,000. **Almond Reservoir** on Canacadea Creek near Hornell, N. Y., begun in 1946 is 80 percent complete. It is a rolled fill 90 ft. high and 1,350 ft. long with concrete spillway and outlet works, costing $6,000,000.

At **Williamsport,** Pa., on the West Branch of the Susquehanna River and along Lycoming Creek levees and flood wall are being built at a cost of $17,000,000. Included are 60,000 ft. of levee, 9,600 ft. of concrete flood wall, 9 pumping stations and a concrete pressure conduit 1,900 ft. long. Work now under way now totals $4,750,000, including a pumping station of 450,000 g.p.m. capacity. On the main river at **Sunbury,** Pa., where Shamokin Creek enters it, the Corps of Engineers is building 14,000 ft. of earth levee. 4,100 ft. of T-type and 8,100 ft. of I-type concrete flood wall, 5 pumping stations and 12,700 ft. of interceptor sewers, costing the federal government $7,300,000. The project is 45 percent complete. Along the Chemung River, another tributary, at **Elmira,** N. Y., 62,800 ft. of earth levee, 11,000 ft. of concrete wall, 6,000 ft. of intercepting sewer, a pumping station and pressure conduit 2,160 ft. long, all estimated to cost $7,100,000 are 79 percent complete.

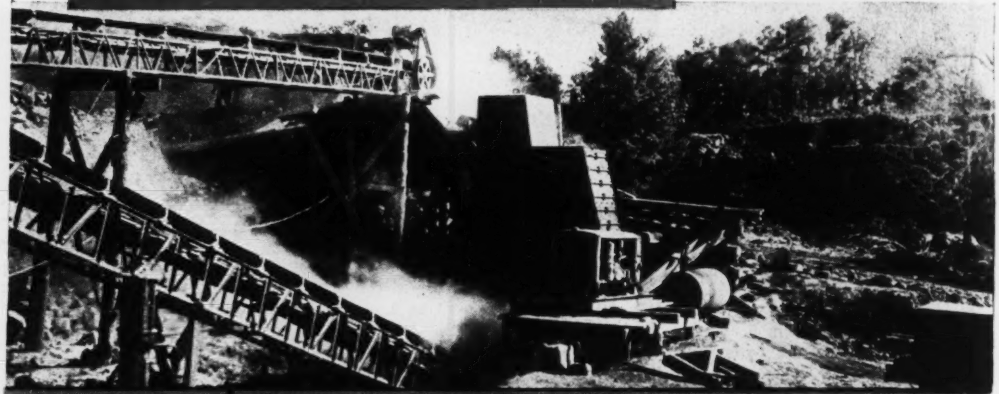
GENESEE RIVER — **Mt. Morris Dam** is being built by the Corps of Engineers on the Genesee River above Rochester, N. Y., for flood control. It is a concrete structure 216 ft. high and 550 ft. long, estimated to cost $24,400,000. Work started in March, 1948, and is scheduled for completion in June 1952.

NEW ENGLAND FLOOD CONTROL—For control of floods in the Connecticut River valley the Corps of Engineers is building two of the several proposed reservoirs. **Union Village Dam** on a tributary in central Vermont, an earthfill 170 ft. high and 1,100 ft. long, is about 75 percent complete under a $3,200,000 contract. On another tributary in northern Massachusetts is **Tully Dam,** an earthfill 62 ft. high and 1,570 ft. long. There a $765,000 contract is 90 percent complete.

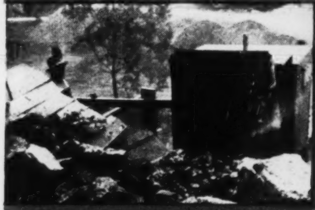
For control of floods on the Merrimack River, **West Peterborough Dam** is being built on a tributary. It also is of rolled earth construction 67 ft. high and 1,000 ft. long. A $1,170,000 contract is 30 percent complete.

In Georgia limestone . . .

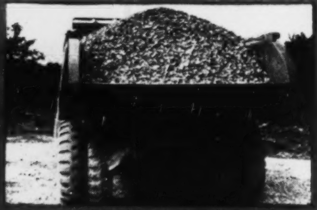
Dual Impact Action does it again



On the job in North Georgia quarry, operated by Lambert Brothers of Knoxville, Tenn.



From this New Holland Model 5050 Breaker accepts run-of-quarry rock up to 50" . . .



To this: Produces clean, cubical aggregate passing 4" in one operation . . .

New Holland Model 5050 Double Impeller Breaker

reduces 50" material to commercial sizes in single pass . . .

- **Like all New Holland Breakers,** the new Model 5050, recently installed by Lambert Brothers, is a field development . . . designed to work in all types of rock, under all conditions . . . built to produce maximum aggregate at minimum cost. Simple, sturdy construction keeps costs *down*—production *up*.

Here are some quick facts — more on request:

Produces up to 400 tons per hour on 300 h.p. Heavy duty steel outer plates. Interior lined with manganese steel wear plates. Spherical roller bearings. All parts accessible; all adjustments easily made by average workman. Mounted on heavy I-beams to simplify installation. Weight 54 tons.

New Holland Double Impeller Breakers are used, recommended by operators everywhere. Get the facts. Write for complete information including location of installation nearest you. Address: Department E-39.

Read

what W. E. Lambert, of Lambert Brothers, Knoxville, Tenn., says about New Holland Model 5050 Double Impeller Breaker shown above.

"The ability of this breaker to reduce 50" material to commercial sizes in one pass is remarkable . . ."

W. E. Lambert

NH

NEW HOLLAND DOUBLE IMPELLER BREAKERS

NEW HOLLAND MANUFACTURING COMPANY, MOUNTVILLE, PA.

Affiliate of the Sperry Corp.

ENGINEERING NEWS-RECORD

Construction Costs

1949 Edition

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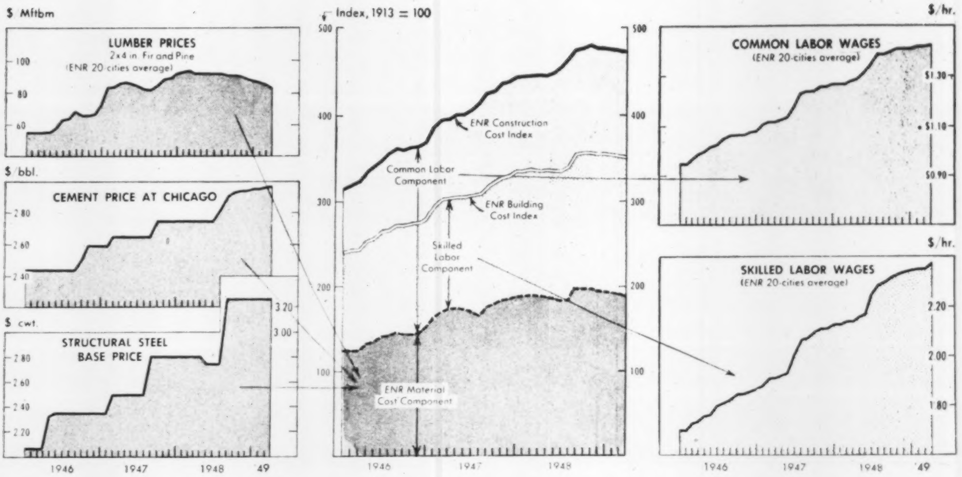


HIGHLIGHTS OF . . .

CONSTRUCTION COSTS—1949

It may be stated with some certainty that 1948 witnessed the turning point in the post war construction price rise. As to wages, the signs are not so clear, but the pressures supporting a fourth round are greatly reduced. If increases come they should be smaller than in previous rounds, and offset by improved productivity.

Lumber held the spotlight all year. Having led the climb up, it started down in March after hitting a record high in February of $93.54 (ENR 20-cities average for 2x4 s4s No. 2 Common). After moving down to $91.55 by May it backed up slightly through July, then in August started the 8-month, slow but steady decline to this month's price of $83.51. This was accompanied by production exceeding shipments and an accumulation of stocks. The March price is 11 percent below the record February high of a year ago, and further declines are expected.

Cement and steel both made history in 1948 by going off the basing point system following the Supreme Court in the cement case.

The cement price average, $2.96, (ENR 20-cities) increased 8½ percent during the year, but changes varied across the country according to location of market with respect to plants and degree of freight absorption that had previously prevailed. Since the price raises became effective in July and August they have remained fairly stable. The only reductions have been in Boston, from $3.65 in August to $3.44 in March, '49, and in Chicago, from $3.00 in October and November to $2.59 in December. This has held through March.

Steel started the year at an average of $2.80 (average price at three mills). In May this dropped to $2.75, but coincident with going off basing point pricing this average went up to $3.25 per cwt. Steel scrap prices broke sharply in early 1949, and steel production improved. The black and grey markets petered out and even pipe supplies improved.

Common labor wages increased 11 percent during 1948, 12 percent in the 15-months through March, 1949 to $1.424 for the ENR average.

Skilled labor wages went up 10 percent for the year, 11 percent during the 15-months ending in March, '49 to $2.376 for the ENR 20-cities average.

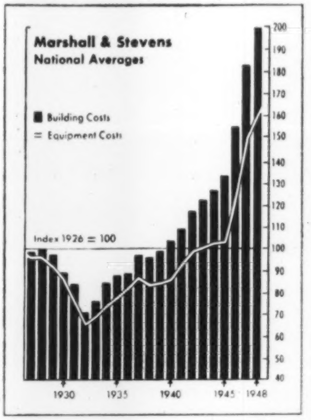
Construction costs, controlled largely by these dominant elements of construction, climbed to their peak in the third quarter and started down gently in the fourth. The ENR Construction Cost Index topped-out at 480 in October, 9 percent above its December, 1947 value, then backed down to 478 in December, 1948, 7.5 percent above the previous December. It has continued down a little each month to 474.8 in March, 7.5 percent above the close of 1947.

The ENR Building Cost Index, too, responded to the drop in lumber prices with a slow but steady decline starting in November, 1948. The October peak of 357 is a rise of 7 percent over the previous December. This moved down slowly to 356 in December '48 and to 352 by March 1949, only 5.5 percent above December 1947.

Other cost indexes are similarly leveling off or moving down. American Appraisal hit its high in October, 1948 at 504, and backed down to 501 by December. Boeckh topped-off at 391 in October and November, then moved down to 390 in December. Aberthaw, reporting quarterly, reached its high in September at 327, and retreated to 323 in December. Turner held at 430 from October through December, and dropped back to 427 in February.

Labor productivity improved slowly but steadily. In September skilled labor had moved up to 73 percent of 1939 standards, and common labor productivity went up to 82 percent. These are the medians of productivity reported by contractors to *Engineering News-Record*, all computed on the same formula and reported in detail in the following pages.

Better construction productivity was evident, too, in prices bid by contractors.



Equipment Costs Indexes—1926=100

Compiled and published by MARSHALL AND STEVENS, Chicago, Illinois

Industry	1929	1932	1939	1942	1945	1946	1947	1948	12/'48
Average of All	**91.9**	**66.1**	**84.8**	**99.6**	**103.4**	**123.2**	**150.6**	**162.8**	**166.0**
Commercial (Aver. of 12*)	91.8	67.6	86.8	101.9	105.2	120.9	146.9	158.6	160.3
Transportation—Garage	91.5	69.2	83.6	96.9	100.9	123.9	157.0	171.1	175.8
Public Utility (Aver. of 2*)	91.8	70.1	82.9	94.3	97.5	119.5	145.8	159.6	162.9
Process (Aver. of 9*)	90.5	73.2	83.6	99.2	103.8	123.0	149.1	161.9	165.2
Food (Aver. of 10*)	92.6	68.5	84.9	98.5	104.1	126.1	156.8	169.7	173.7
Metal Working	92.3	67.9	83.6	109.5	110.7	131.2	151.3	161.8	165.1
Aircraft	93.0	66.7	85.0	106.4	109.8	127.9	162.9	178.3	183.0
Mach. and Parts, Elec. Equip	92.0	68.0	83.4	103.1	106.8	130.3	156.6	167.4	170.7
Textile	91.1	67.8	83.7	99.1	101.8	122.1	146.6	157.4	160.7
Woodworking	92.0	67.2	83.6	97.0	100.9	123.0	149.6	160.4	163.7
General (Aver. of 7*)	95.5	68.8	84.6	99.5	103.2	122.0	149.7	162.0	165.5
Cold Storage—Refrigerating	92.0	70.0	82.1	95.8	101.7	125.7	163.2	176.6	181.3
Contractors' Equipment	91.0	71.9	82.4	100.8	102.5	124.2	150.3	161.1	164.4

MARSHALL AND STEVENS INDEXES cover both comparative building costs, 1902 to date, and comparative equipment costs, 1913 to date. The building indexes are national averages with a system of modifiers to get regional and municipal values for each of four types of building. A. Fireproof, protected steel, B. Fireproof, reinforced concrete, C. Masonry buildings, D. Frame. They are designed to reflect normal costs in line with recognized or published prices of building materials, equipment and labor. Extraordinary or intangible conditions are not included. Composite building cost series converted to 1913 = 100 is shown on chart insert.

Comparative equipment costs, developed to cover the composite of the entire plant, machinery of various kinds, mechanical installation, furniture and fixtures, hand tools and other and combined in proper proportion to their average occurrence in each plant are computed for 47 industries. Eleven series are reproduced here, five of which are averages of 3 or more M&S related series). These are M&S estimates of actual costs paid for installed plant equipment, as a whole.

* In each of these categories, MARSHALL AND STEVENS report separate comparative equipment cost trends for:

COMMERCIAL: **Apartment, Bank, Church, Hotel, Library, Restaurant, School, Store, Theatre, Hospital, Dwelling, Office**

PUBLIC UTILITY: **Steam Power, Electric Power**

PROCESS: **Distillery, Cement, Chemical, Glass, Petroleum Industry, Paint, Paper, Rubber, Clay Products**

FOOD: **Bakery, Bottling, Brewery, Candy, Cannery-fish, Cannery-fruit, Creamery, Dairy, (Flour, cereal feed), Packing-fruit, Packing-meat**

GENERAL: **Laundry, Mining and Milling, Motion Picture, Printing, Shipbuilding, Warehouses, Logging**

Building Cost Indexes—1913=100

Two types of building cost indexes are represented in the colored chart facing this page, 1. weighted indexes and 2. contractor indexes based on repricing the same structure at periodic intervals. Details on individual indexes follow: All use 1913 = 100 as base except Aberthaw & Austin.

AMERICAN APPRAISAL COMPANY—based on detailed analysis of materials and labor required for representative types of industrial building structures, repriced monthly in accordance with 1. prevailing wage scales and labor performance for the various building trades, and 2. quotations for construction materials in 30 key cities in the United States. The index assumes normal average conditions and does not give any recognition to overtime or bonus payments to labor or premiums paid for materials in individual cases or under temporary abnormal conditions. Applies to construction only, does not include factors for building fixtures and decorations. Oct. '48 value 504; Dec. '48, 501.

American Appraisal Cost Index

	'26	'32	'39	'42	'45	'46	'47	'48
	30 cities							
U. S. Average	**217**	**155**	**200**	**241**	**271**	**322**	**430**	**490**
Boston	224	169	210	248	270	320	420	477
New York	234	170	219	248	272	327	441	508
Buffalo	219	157	205	247	279	328	440	503
Baltimore	224	166	198	248	277	335	445	507
Philadelphia	225	161	196	247	275	317	417	477
Pittsburgh	236	172	219	249	279	325	424	486
Cincinnati	217	157	209	242	272	317	422	483
Cleveland	233	160	206	245	268	319	431	494
Chicago	219	162	205	235	260	303	404	456
Indianapolis	219	157	205	247	276	327	440	501
Detroit	224	148	207	252	278	335	441	504
Milwaukee	218	144	209	254	280	328	437	499
Minneapolis	197	148	202	235	266	310	401	455
Kansas City	220	156	209	239	268	321	420	480
St. Louis	230	163	207	238	265	314	422	478
Atlanta	211	147	187	240	278	344	457	521
Dallas	204	146	171	209	246	291	397	451
New Orleans	217	145	194	234	277	324	429	493
Denver	204	149	195	226	245	297	393	443
Seattle	199	141	195	244	277	324	443	506
San Francisco	188	144	180	225	244	297	401	446
Los Angeles	195	141	167	213	249	307	422	473

ABERTHAW COMPANY—Until March 31, 1946, New England seven-story and basement (62'4" x 202'4"), reinforced concrete building built in 1914, repriced quarterly as a construction bid to duplicate original building. Since March 31, 1946, New England, composite of 36 major cost items in three multi-story and two one-story industrial buildings, including all mechanical trades, repriced using actual and estimated labor and material costs. Base: 1914 = 100. Sept. '48 value 327, Dec., 323.

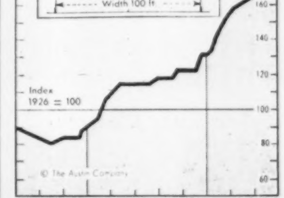
ASSOCIATED GENERAL CONTRACTORS OF AMERICA (AGC)—Wages and materials for 12 cities combined in 40-60 ratio. Wages, prevailing rates for hod carriers and common labor. Materials, weighted: sand, gravel and crushed stone, 1; cement, 1; lumber, 1; hollow tile, ½; structural and reinforcing steel, ½. Dec. '48 value 341.

FRUIN-COLNON CONTRACTING CO.—Industrial plant of five buildings in St. Louis repriced on basis of contractor's actual and estimated material and labor costs. Dec. '48 value 391.

GEORGE A. FULLER COMPANY—Composite of 36 major cost elements, in three commercial type buildings, including mechanicals, elevators, wiring, heating and ventilating, repriced. Jan. '49 value 390.

TURNER CONSTRUCTION COMPANY—Eastern cities. Own building cost experience applied to these factors: labor rates, material prices, productivity of labor, efficiency of plant and management, competitive conditions, forecast of price trends. Dec. '48 value 430, Feb. '49, 427.

AUSTIN COMPANY: INDUSTRIAL BUILDING COST—Reprices typical one-story, steel frame, monitor type industrial building at regular intervals. Structure has concrete foundations; brick curtain walls; continuous steel sash; concrete floor laid on ground; 2-in. wood roof deck on timber purlins covered with 4-ply waterproofing. Monitor sash equipped with mechanical operators. Heating, lighting, plumbing, sprinkler systems and other building services not included. Pricing at representative points in central and eastern states.



ENGINEERING NEWS-RECORD CONSTRUCTI

The Engineering News-Record Construction and Building Cost Indexes reflect wage rate and material price trends. They do not adjust for labor efficiency, materials availability, competitive conditions, management, mechanization or other "intangibles" affecting construction costs.

A hypothetical cube of construction requiring 6 bbls. of cement, 1.088 M ft. bm. of lumber, 2,500 lbs. of steel and 200 hours of common labor is used to measure the trend of the cost of heavy engineering construction.

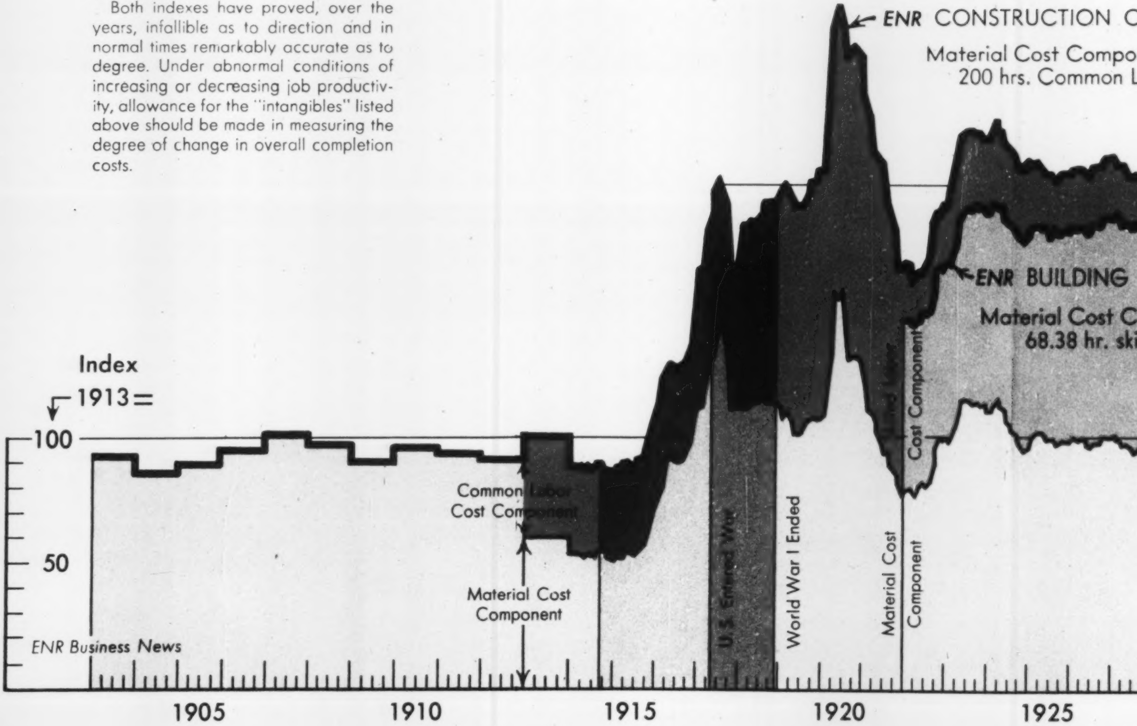
The building cost index is based on a similar hypothetical cube using the same quantities of materials, but 68.38 hours of skilled labor.

This simple structure was adopted to facilitate prompt reporting of changes due to price and wage rate movements, both as to direction and degree.

Both indexes have proved, over the years, infallible as to direction and in normal times remarkably accurate as to degree. Under abnormal conditions of increasing or decreasing job productivity, allowance for the "intangibles" listed above should be made in measuring the degree of change in overall completion costs.

ENGINEERING NEWS-RECORD CONSTRUCTION COST INDEX

	1926	1932	1939	1942	1945	1946	1947	1948	1949
Jan.	207.2	162.5	234.7	267.6	302.5	316.3	387.0	441.7	477.4
Feb.	206.6	161.8	234.3	269.4	303.7	319.5	393.7	442.7	475.4
Mar.	207.7	157.2	234.4	269.7	304.5	323.8	395.5	443.6	....
Apr.	207.1	153.1	234.9	271.8	306.4	334.6	399.7	443.6	....
May	207.3	152.8	234.7	272.3	307.4	340.5	400.0	444.9	....
June	204.8	152.2	235.0	274.2	309.0	348.7	406.6	455.8	....
July	207.8	153.4	234.9	277.7	309.0	354.7	413.8	464.8	....
Aug.	208.3	156.8	234.9	281.6	309.1	361.4	422.9	477.1	....
Sept.	208.3	158.0	235.0	281.6	309.3	360.2	426.4	478.4	....
Oct.	209.8	159.2	236.9	282.4	309.3	360.9	434.6	480.2	....
Nov.	210.8	158.2	238.2	283.6	309.3	362.5	436.9	478.3	....
Dec.	210.8	158.5	238.2	283.7	313.5	369.3	441.1	477.7	....
Aver.	**208.0**	**157.0**	**235.5**	**276.3**	**307.8**	**346.0**	**413.2**	**460.7**	....

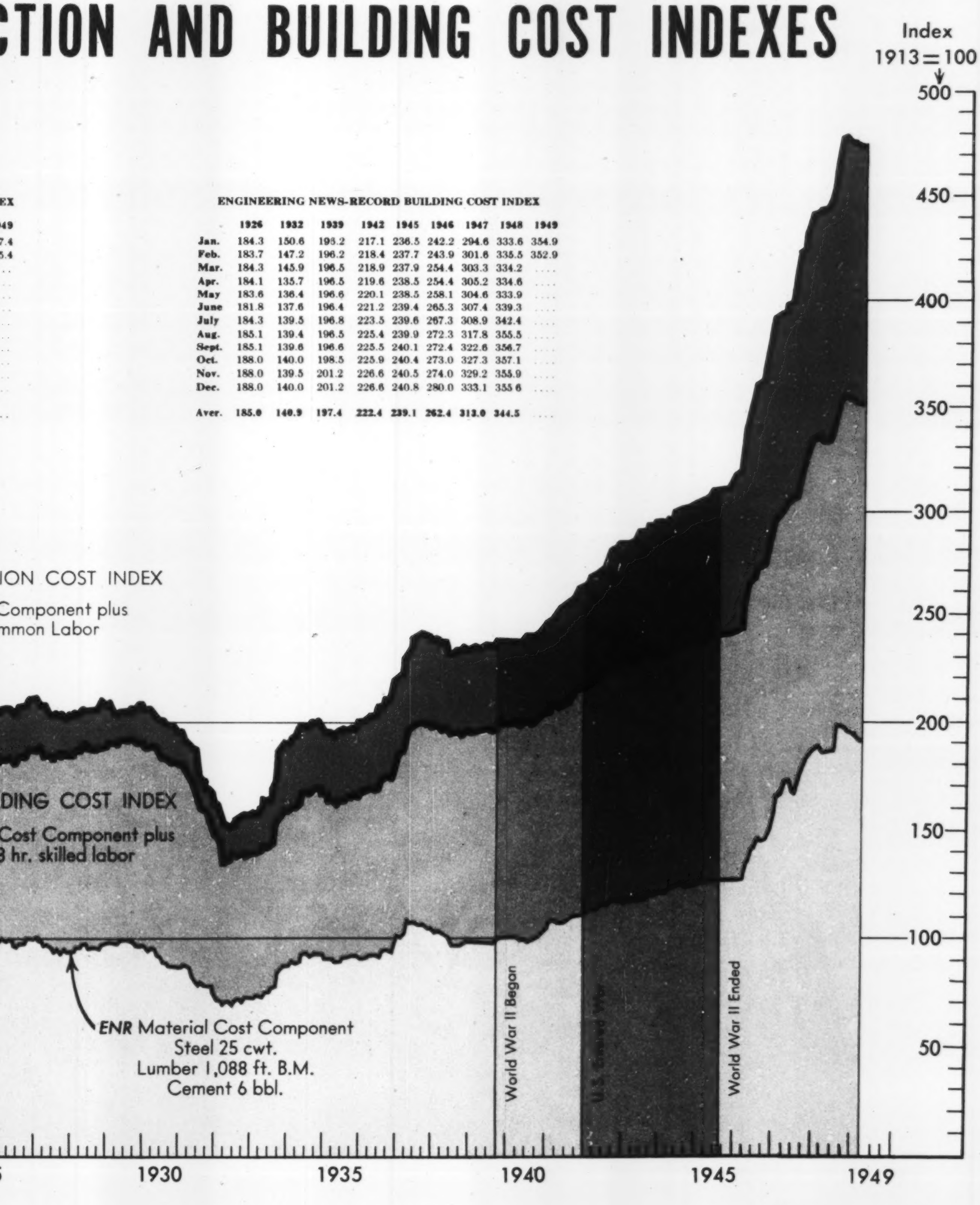


Reprints of this chart are available from Engineering News-Record offices, 330 W. 42 St., New York 18, N. Y., 10¢ per copy.

CTION AND BUILDING COST INDEXES

ENGINEERING NEWS-RECORD BUILDING COST INDEX

	1926	1932	1939	1942	1945	1946	1947	1948	1949
Jan.	184.3	150.6	196.2	217.1	236.5	242.2	294.6	333.6	354.9
Feb.	183.7	147.2	196.2	218.4	237.7	243.9	301.6	335.5	352.9
Mar.	184.3	145.9	196.5	218.9	237.9	254.4	303.3	334.2	....
Apr.	184.1	135.7	196.5	219.6	238.5	254.4	305.2	334.6	....
May	183.6	136.4	196.6	220.1	238.5	258.1	304.6	333.9	....
June	181.8	137.6	196.4	221.2	239.4	265.3	307.4	339.3	....
July	184.3	139.5	196.8	223.5	239.6	267.3	308.9	342.4	....
Aug.	185.1	139.4	196.5	225.4	239.9	272.3	317.8	355.5	....
Sept.	185.1	139.6	196.6	225.5	240.1	272.4	322.6	356.7	....
Oct.	188.0	140.0	198.5	225.9	240.4	273.0	327.3	357.1	....
Nov.	188.0	139.5	201.2	226.6	240.5	274.0	329.2	355.9	....
Dec.	188.0	140.0	201.2	226.6	240.8	280.0	333.1	355 6	....
Aver.	**185.0**	**140.9**	**197.4**	**222.4**	**239.1**	**262.4**	**313.0**	**344.5**	....



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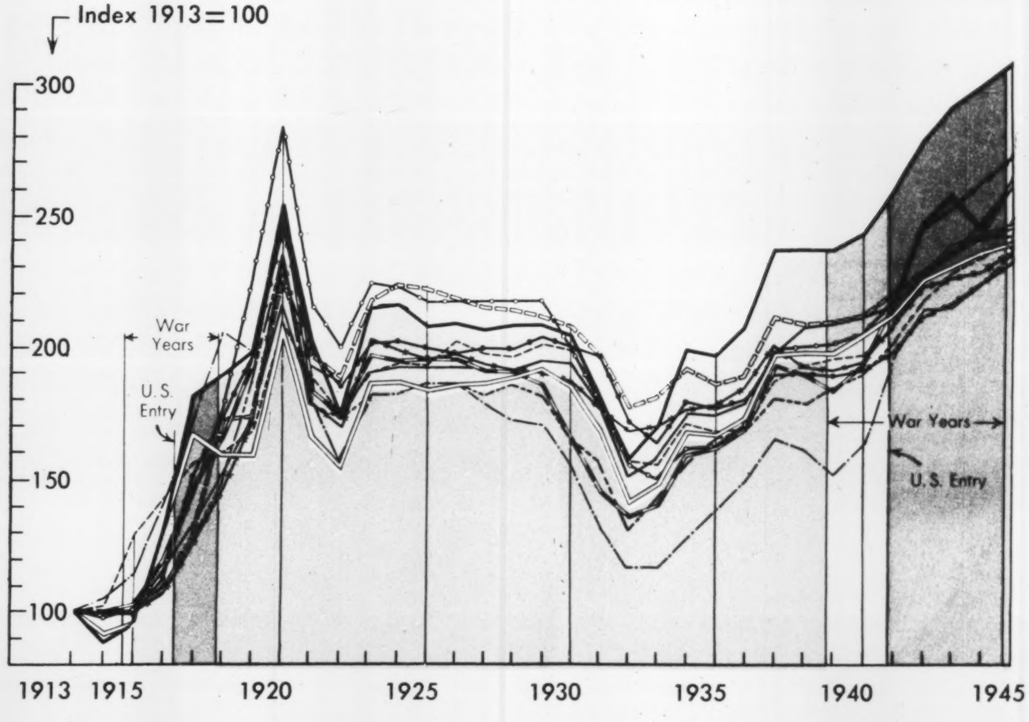
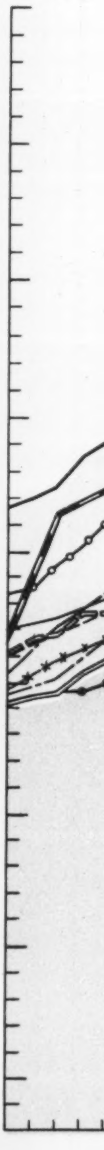
BUILDING AND CONSTRUCTION COST INDE

		1948	1947	1946	1945	1942	1939	1932	1926
	Weighted Indexes								
━━━	ENR Construction	461	413	346	308	276	236	157	208
▭	ENR Building	345	313	262	239	222	197	141	185
-○-○-○-	American Appraisal	490	430	322	271	241	200	155	217
-●-●-●-	Assoc. Gen. Contr	332	296	257	231	209	188	171	197
───	Boeckh, U. S. aver	374	329	286	261	226	208	152	193
—··—	Marshall & Stevens	368	338	288	248	218	183	130	185
	Contractor Indexes								
-✱-✱-✱-	Aberthaw (1914 = 100)	321	304	279	236	223	190	168	197
—·—·—	Austin	317	301	273	234	213	152	117	185
▭▭▭	Fruin-Colnon	382	347	285	247	227	208	178	218
- - - -	Fuller	380	354	290	241	229	195	157	202
▭▬▭▬	Turner	422	380	318	263	245	182	136	195





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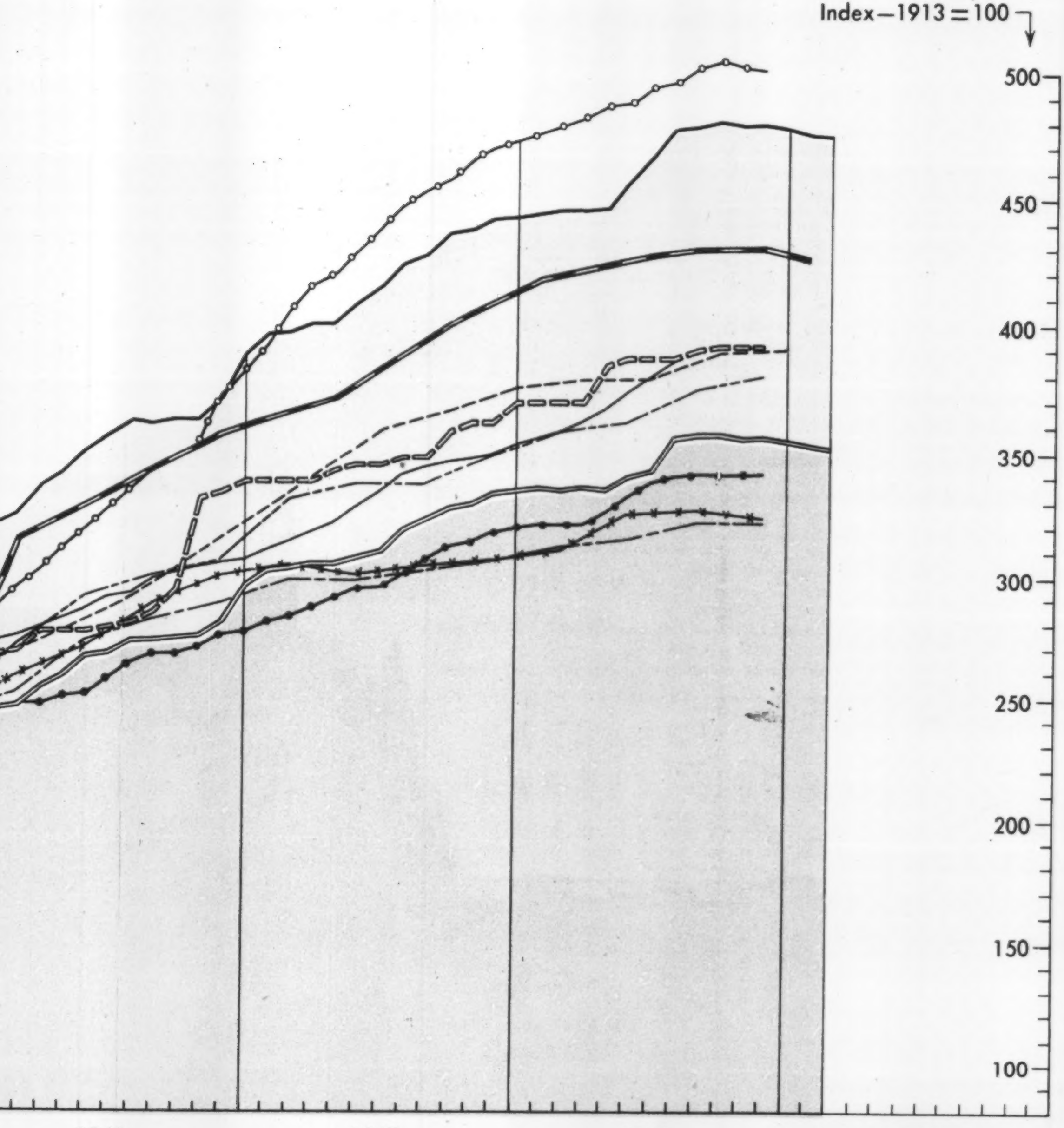
NDEXES COMPARED



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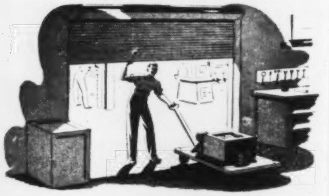
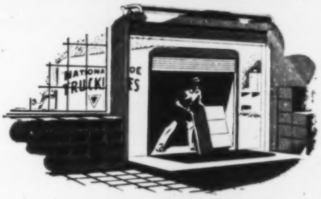
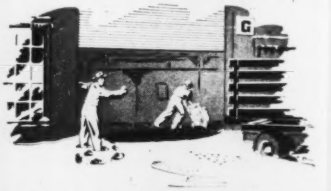
STOP EFFICIENCY LOSS at DOORWAYS...



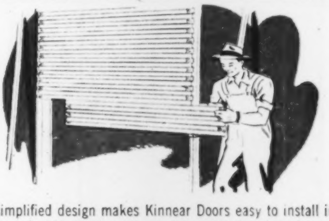
Kinnear Rolling Doors open smoothly, quickly and easily upward, avoiding all ground obstructions and leaving the entire opening clear.



Coiling compactly above the lintel, Kinnear Doors leave **all** floor and wall space fully usable at all times.



Kinnear's all-metal curtain of sturdy interlocking slats provides a strong barrier against winds and storms.



Rugged, simplified design makes Kinnear Doors easy to install in any opening. Accidental damage can be repaired at lowest cost.

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Other Bases for Engineering News-Record Cost Indexes

For convenience in comparing cost index rises with prewar conditions the Engineering News-Record Construction and Building Cost Indexes are given here for three bases 1926 = 100, 139 = 100 and 1940 = 100. Many postwar projects had their cost estimates based on 1940 price and wage levels with the proviso that these estimates should be adjusted to future postwar conditions in proportion to the rise in the Engineering News-Record Cost Indexes. This 1940 = 100 base series will aid in making these adjustments.

A partial historical record of the Engineering News-Record Cost Indexes is reported on a preceding page based on 1913 = 100. To convert from this original base year of 1913, on which these indexes are computed, to other bases, the accompanying conversion table can be used.

BASE CONVERSION TABLE

To convert Engineering News-Record Construction and Building Cost Indexes

	Divide 1913 = 100 Index Values	
From Base 1913 = 100 To Base	for Construction Cost Index Divide by	for Building Cost Index Divide by
1940 = 100	2.4196	2.0281
1939 = 100	2.3551	1.9744
1926 = 100	2.0803	1.8499
1929 = 100	2.0702	1.9086
1910-14 = 100	.9380	.9477
1924 = 100	2.1536	1.8578
1923-25 = 100	2.1204	1.8481
1914 = 100	.8856	.9191
1911 = 100	.9343	.9414

Year	ENR Construction Cost Index			ENR Building Cost Index		
BASE	'26= 100	'39= 100	'40= 100	'26= 100	'39= 100	'40= 100
1926 Aver.	**100.0**	**88.3**		**100.0**	**93.6**	**91.2**
1927	99.1	87.5	85.9	100.6	94.4	91.7
1928	99.4	87.8	85.2	101.6	95.2	92.6
1929	99.5	87.9	85.4	103.1	96.6	94.1
1930	97.5	86.1	85.5	100.2	93.9	91.4
1931	87.1	77.0	83.8	91.3	85.7	83.5
1932	**75.4**	**66.6**	**74.9**	**75.7**	**71.3**	**69.4**
1933	81.8	72.2	64.8	79.5	74.8	72.8
1934	95.2	84.1	70.3	90.1	84.4	82.1
1935	94.4	83.4	81.8	89.6	83.9	81.7
1936	99.2	87.6	81.8	93.1	87.2	84.9
1937	112.7	99.6	85.3	106.1	99.3	96.7
1938	113.3	100.1	97.0	106.4	99.6	97.0
1939	**113.2**	**100.0**	**97.4**	**106.7**	**100.0**	**97.3**
1940	116.3	102.7	97.3	109.6	102.7	100.0
1941	124.0	109.4	100.0	114.3	107.1	104.2
1942	**132.8**	**117.3**	**106.5**	**120.2**	**112.6**	**109.6**
1943	139.4	123.1	114.1	123.7	115.8	112.8
1944	143.6	126.8	119.8	126.9	118.8	115.7
1945	**147.9**	**130.6**	**123.4**	**129.3**	**121.1**	**117.8**
1946	**166.3**	**146.9**	**143.0**	**141.8**	**132.9**	**129.4**
1947	**198.6**	**175.4**	**170.8**	**169.2**	**158.5**	**154.3**
1948	**221.5**	**195.6**	**190.4**	**186.2**	**174.5**	**169.9**
1949 Feb.	**228.5**	**201.8**	**196.5**	**190.8**	**178.7**	**174.0**

Public Utility Construction Cost Index

Compiled and published by Whitman, Requardt and Associates, and B. L. Smith & Associates, Baltimore, Md., for the Estate of William W. Handy

Table No. 1 Cost Trends of Building Construction 1911 to 1914 = 100

(Complete Index reports 13 items entering into Building Construction Costs.)
A relates to Reinforced Concrete Bldg.; B relates to Brick Bldg.

	Jan. 1926	July 1926	Jan. 1932	July 1932	Jan. 1939	July 1939	Jan. 1942	July 1942	Jan. 1945	July 1945	Jan. 1946	July 1946	Jan. 1947	July 1947	Jan. 1948	July 1948	Jan. 1949
Atlantic Seaboard Division																	
A	213	213	171	159	205	207	250	253	259	260	271	304	336	353	382	422	436
B	228	229	189	173	211	214	246	250	262	265	276	308	329	351	372	404	429
North Central Division																	
A	203	201	169	154	200	200	237	242	249	253	256	291	326	339	371	409	421
B	212	211	181	164	203	203	229	234	248	250	259	284	310	324	352	375	389
South Central Division																	
A	192	191	149	144	188	187	232	236	242	243	249	279	318	334	364	399	411
B	203	204	160	154	191	191	223	227	235	238	244	272	299	322	341	370	382
Plateau Division																	
A	198	197	153	149	194	194	230	235	238	239	248	278	307	327	349	385	402
B	211	210	167	163	199	200	221	227	231	233	257	286	309	331	349	378	396
Pacific Division																	
A	191	190	157	148	192	192	238	241	248	248	251	294	328	343	374	411	416
B	198	197	164	156	193	193	226	231	241	242	245	279	303	329	354	378	386

Table No. 2 Cost Trends of Gas Plant Construction 1911 = 100

(Complete Index reports 17 items entering into Gas Plant Construction Costs.)
A relates to Total Constr. & Equip.; B relates to Mech. Equip. Exclusive of Gas Holders

	Jan. 1926	July 1926	Jan. 1932	July 1932	Jan. 1939	July 1939	Jan. 1942	July 1942	Jan. 1945	July 1945	Jan. 1946	July 1946	Jan. 1947	July 1947	Jan. 1948	July 1948	Jan. 1949
Atlantic Seaboard Division																	
A	230	230	202	188	241	249	272	275	283	288	302	334	366	398	413	446	469
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447
North Central Division																	
A	217	218	198	178	232	232	249	254	264	269	272	308	335	367	384	417	435
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447
South Central Division																	
A	199	200	171	160	216	217	244	249	258	261	266	298	335	359	379	404	420
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447
Plateau Division																	
A	202	202	176	166	216	217	232	237	240	243	255	290	313	344	359	386	403
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447
Pacific Division																	
A	205	206	187	177	227	228	253	257	264	266	271	315	342	369	387	416	433
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447

Table No. 3 Cost Trends of Electric Light and Power Construction 1911 = 100

(Complete Index reports 50 items entering into Electric Light and Power Construction Costs.)

A relates to Total Constr. & Equip.; B to Accessory Electric Equipment† C to Sub-sta. Equip.

	Jan. 1926	July 1926	Jan. 1932	July 1932	Jan. 1939	July 1939	Jan. 1942	July 1942	Jan. 1945	July 1945	Jan. 1946	July 1946	Jan. 1947	July 1947	Jan. 1948	July 1948	Jan. 1949
Atlantic Division																	
A	197	194	182	176	224	225	248	248	251	259	266	303	327	351	357	377	401
B	197	196	192	186	225	224	241	239	226	237	248	278	308	323	323	333	340
C	184	178	172	168	203	203	217	216	207	218	228	252	273	288	288	296	306
North Central Division																	
A	190	187	186	174	219	218	235	238	238	243	245	280	299	324	333	351	375
B	189	188	199	186	224	223	229	231	216	218	222	249	272	289	292	300	309
C	178	171	181	169	203	202	207	209	198	200	204	225	240	257	260	264	278
South Central Division																	
A	184	183	179	171	218	218	245	246	248	251	251	288	310	336	344	365	391
B	187	189	200	190	231	230	250	248	235	235	235	267	290	311	314	326	341
C	175	171	181	173	210	209	226	226	217	217	217	243	257	278	281	290	310
Plateau Division																	
A	190	188	177	171	218	219	234	236	238	241	244	282	300	329	334	355	378
B	197	196	194	188	231	232	237	236	225	225	225	259	279	302	303	315	322
C	185	177	175	171	209	211	213	212	207	207	207	234	246	269	269	278	289
Pacific Division																	
A	180	178	172	163	216	215	235	242	242	244	244	283	300	332	339	359	383
B	178	177	182	170	222	222	231	240	225	225	225	256	275	303	303	317	328
C	167	161	164	155	203	202	210	219	208	208	208	234	244	272	273	284	298

†Formerly called "Electric Plant-Steam."

Individual series for 81 cost elements in three classes of utility construction, for five geographic divisions of the United States are reported. Weighting is based on wide experience in cost analysis of plant and construction. Material prices from Engineering News-Record, Iron Age and various manufacturers; labor rates from utilities, unions and builders' associations.

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Boeckh Index of Construction Costs—U. S. Average, 1926–'29=100

Annual Averages By Cities	Residences		Apartments, Hotels, Office Bldgs.			Commercial & Factory Bldgs.				
				Brick and				Brick and		
	Frame	Brick	Wood	Conc.	Steel	Frame	Steel	Wood	Steel	Conc.
U. S. AVERAGE										
1926-29	101.4	102.5	102.5	102.8	101.3	102.2	100.8	101.7	102.2	104.6
1939	101.2	104.4	104.1	111.2	109.4	101.3	110.4	105.0	112.1	113.3
1942	120.8	121.3	121.1	121.6	121.1	122.7	119.2	119.0	123.1	123.3
1945	147.7	147.2	147.2	140.5	141.9	151.2	135.4	143.7	142.1	142.4
1946	161.8	161.9	161.7	154.0	154.8	165.6	145.0	158.7	154.8	156.0
1947	196.6	195.1	194.6	177.7	180.3	202.4	165.7	189.0	179.3	179.4
1948	221.4	219.2	218.9	201.0	204.0	228.1	188.1	212.3	202.3	203.9
ATLANTA AREA										
1926-29	82.7	87.0	84.2	83.7	87.0	82.9	94.5	84.7	87.5	86.8
1939	82.8	86.0	86.1	95.1	95.0	80.6	96.2	88.6	94.6	97.4
1942	102.5	102.8	102.8	104.4	105.1	101.1	106.3	101.4	105.1	104.9
1945	133.9	132.1	132.5	123.3	127.0	135.9	120.7	130.1	123.3	122.8
1946	149.2	148.1	148.2	136.8	139.9	151.7	130.0	146.8	135.1	136.4
1947	181.0	180.4	181.4	158.1	164.6	187.5	150.1	174.9	158.0	157.1
1948	202.5	199.2	199.5	178.8	185.8	205.2	173.0	193.1	178.8	178.8
BALTIMORE AREA										
1926-29	107.2	112.0	107.6	100.6	100.7	106.3	95.5	106.8	96.8	101.2
1939	93.5	95.5	95.6	99.3	99.2	94.0	101.7	96.6	101.4	100.2
1942	115.1	115.0	115.1	113.6	113.9	115.9	112.2	114.4	116.6	114.2
1945	147.4	145.8	146.0	134.9	137.1	150.9	129.4	141.9	136.4	135.4
1946	163.1	161.7	162.2	149.1	150.8	167.6	138.9	158.8	150.0	148.2
1947	199.5	197.3	196.9	173.9	177.0	204.4	159.7	193.9	175.0	175.6
1948	221.5	219.5	219.8	196.0	199.7	227.0	181.7	215.6	197.1	199.0
BIRMINGHAM AREA										
1926-29	91.7	96.7	94.1	95.5	96.8	90.2	97.5	94.6	96.3	96.3
1939	87.8	90.9	91.5	96.1	96.2	84.9	96.9	95.1	95.6	96.3
1942	108.4	110.8	110.6	110.7	111.0	108.7	107.8	111.3	110.6	112.5
1945	135.2	135.1	135.7	127.1	121.1	136.2	120.8	133.5	126.2	127.7
1946	149.3	147.4	147.9	137.3	139.4	149.7	128.1	145.4	135.2	137.4
1947	175.3	174.2	174.1	154.9	159.5	182.6	146.1	167.7	153.7	155.7
1948	199.9	195.1	195.2	174.4	180.5	205.6	171.3	187.6	175.5	175.3
BOSTON AREA										
1926-29	116.3	120.3	115.4	106.2	107.0	118.8	106.3	112.5	108.7	105.8
1939	106.2	110.4	110.1	116.3	113.7	105.7	114.2	111.5	118.2	118.5
1942	128.4	129.4	129.0	124.3	123.6	131.5	120.1	123.7	126.3	126.3
1945	152.5	151.1	150.9	142.1	143.2	157.4	136.7	145.8	144.6	145.0
1946	167.0	166.5	166.0	156.8	156.6	172.1	147.1	161.1	158.5	160.4
1947	203.8	202.5	202.0	182.1	183.8	209.6	166.5	196.4	192.4	185.8
1948	227.5	226.2	225.6	205.3	207.7	234.7	190.0	218.8	207.1	209.7
CHICAGO AREA										
1926-29	109.2	114.2	109.8	113.2	109.1	112.9	105.2	105.9	112.0	116.0
1939	110.6	112.5	111.1	123.6	118.7	114.2	117.6	109.3	122.6	127.6
1942	131.7	130.2	128.9	129.7	127.4	137.7	121.4	122.9	129.2	132.2
1945	156.6	154.6	152.4	147.8	146.1	163.7	135.7	145.2	146.3	151.3
1946	168.3	166.0	164.2	158.9	156.9	168.1	144.5	157.4	157.0	162.5
1947	201.0	198.3	194.4	180.8	180.1	210.5	163.3	185.0	179.6	184.5
1948	224.5	219.9	217.5	201.7	202.0	235.8	183.2	206.4	201.1	205.9
CINCINNATI AREA										
1926-29	100.5	105.0	101.3	101.0	100.2	100.2	99.6	103.1	100.6	101.0
1939	103.3	106.2	105.9	113.9	110.4	103.3	111.7	107.1	113.7	116.5
1942	117.1	118.4	118.1	120.6	118.8	118.5	115.5	116.9	119.9	122.1
1945	151.2	152.1	152.1	142.7	142.8	153.1	132.8	151.7	142.9	145.1
1946	165.6	166.8	166.7	154.5	154.7	167.5	140.7	166.4	154.4	156.1
1947	199.8	199.7	199.4	177.5	179.6	203.9	162.5	196.4	179.6	180.1
1948	222.6	222.0	221.2	201.5	202.5	227.6	184.8	217.5	201.9	205.7
CLEVELAND AREA										
1926-29	107.2	113.4	108.5	111.3	108.3	109.0	103.0	107.2	110.5	114.8
1939	106.2	109.0	109.5	115.3	112.8	107.5	112.9	109.5	117.7	118.0
1942	123.2	125.3	124.7	127.6	124.8	128.1	119.9	123.1	128.0	130.8
1945	154.9	154.7	153.9	148.3	147.3	158.8	136.9	149.6	148.7	151.9
1946	169.2	169.4	168.7	160.2	159.9	174.1	146.4	164.3	161.0	165.9
1947	205.7	203.9	202.7	185.6	185.9	213.4	168.9	195.4	187.3	189.7
1948	229.8	228.2	226.4	209.4	208.7	238.7	190.5	219.6	210.9	214.5
DALLAS AREA										
1926-29	103.1	107.3	103.2	98.9	99.1	103.6	100.5	100.9	99.4	99.7
1939	95.1	95.8	96.7	98.8	100.2	94.8	106.6	96.0	101.9	98.9
1942	117.9	115.9	116.8	110.8	114.5	119.7	118.5	111.3	116.8	109.4
1945	135.8	134.5	134.9	127.4	131.0	138.2	129.3	130.1	130.8	127.9
1946	150.2	148.8	149.4	139.8	144.4	153.5	140.3	144.6	142.5	141.1
1947	188.2	185.4	183.5	165.8	170.4	194.5	162.8	175.5	167.4	162.6
1948	214.5	207.5	207.9	186.1	193.9	224.4	185.4	197.9	189.0	184.0
DENVER AREA										
1926-29	95.0	99.7	95.5	102.4	99.6	95.5	105.5	94.6	101.4	108.0
1939	112.1	112.0	111.2	116.1	114.4	114.3	118.7	109.5	117.0	117.8
1942	121.8	121.8	120.4	122.5	121.9	124.2	125.1	118.7	124.2	124.9
1945	147.6	146.7	147.1	141.1	145.2	152.4	145.8	142.2	147.8	144.4
1946	160.1	160.3	150.4	155.3	157.9	164.0	155.6	156.8	160.0	158.3
1947	194.2	194.7	194.9	180.9	184.0	197.9	176.6	192.0	185.6	183.1
1948	218.1	217.8	217.7	202.7	206.2	223.0	197.9	213.6	206.7	207.0
DETROIT AREA										
1926-29	103.3	108.4	104.3	102.9	102.4	103.7	103.1	103.5	103.3	104.4
1939	98.8	102.7	102.9	108.6	107.5	98.7	108.8	104.2	111.4	110.1
1942	119.0	120.6	120.5	121.3	119.9	120.3	116.3	119.4	122.5	123.1
1945	149.9	149.4	149.7	143.0	144.1	154.3	137.3	145.4	145.8	144.1
1946	165.9	165.9	165.8	157.4	157.9	171.3	147.5	160.9	160.0	159.7
1947	201.2	199.9	199.5	182.3	182.7	208.5	168.3	191.5	186.0	186.1
1948	224.7	223.4	223.0	203.8	205.1	231.5	187.9	215.9	206.5	207.2
KANSAS CITY AREA										
1926-29	100.3	106.5	102.2	105.7	103.3	101.1	105.9	101.9	107.5	108.8
1939	164.4	109.9	109.8	118.3	115.4	103.8	117.2	113.0	120.0	121.6
1942	123.1	124.7	125.0	124.6	123.6	124.7	121.7	124.8	127.1	126.5
1945	150.6	148.8	148.7	142.7	144.1	156.5	139.6	143.4	145.4	144.4
1946	166.5	165.6	165.4	158.2	159.5	172.3	151.0	159.8	159.3	160.3
1947	198.6	196.0	195.9	178.4	182.8	205.4	171.1	188.1	182.2	179.6
1948	227.6	224.3	224.4	203.9	209.0	235.9	195.5	214.9	208.2	206.7
LOS ANGELES AREA										
1926-29	92.7	97.9	93.5	98.8	96.8	93.5	97.0	91.3	97.5	103.1
1939	93.6	97.2	97.5	103.7	105.0	95.6	109.5	96.8	106.2	104.9
1942	119.3	115.6	116.1	116.6	119.4	118.3	123.3	112.4	121.3	116.3
1945	139.8	138.3	139.0	134.9	139.4	144.4	140.9	133.3	140.4	135.0
1946	155.1	156.1	156.2	155.3	156.7	160.1	158.3	150.9	160.0	158.7
1947	192.0	190.8	190.9	180.6	184.1	198.1	176.4	183.4	184.8	182.6
1948	216.5	215.9	215.7	205.8	209.5	223.0	199.7	208.2	209.8	210.0
MINNEAPOLIS AREA										
1926-29	92.8	98.2	94.6	95.6	96.1	92.8	100.0	93.9	97.9	98.4
1939	101.9	105.6	104.2	113.5	110.7	102.7	113.4	103.6	114.5	117.2
1942	121.2	121.4	120.6	120.5	120.9	124.5	118.9	116.8	122.7	124.2
1945	149.8	150.9	150.8	141.1	141.2	152.2	132.4	149.4	142.6	143.5
1946	163.7	167.6	167.5	156.5	155.7	164.9	142.6	168.2	157.2	159.5
1947	195.5	195.2	194.8	175.2	178.4	199.8	161.9	190.8	178.2	175.5
1948	223.3	222.1	221.6	200.8	203.9	229.0	186.2	214.9	201.5	204.9
NEW ORLEANS AREA										
1926-29	93.3	96.3	93.4	86.5	90.6	93.3	93.7	91.5	89.5	86.5
1939	89.0	90.3	91.3	95.4	98.3	88.1	102.8	91.7	98.5	94.9
1942	110.6	109.9	110.3	110.7	113.0	114.0	118.0	108.0	114.6	111.2
1945	136.4	134.4	134.5	127.7	131.6	139.1	131.1	130.5	131.6	128.4
1946	148.9	147.4	148.2	138.6	142.8	151.2	138.7	145.4	142.0	138.7
1947	161.9	178.7	179.2	159.2	166.7	186.2	156.4	174.1	162.7	157.4
1948	204.5	200.3	200.5	177.2	184.9	209.5	170.7	194.3	178.7	176.9
PHILADELPHIA AREA										
1926-29	100.3	106.3	103.7	105.9	103.1	98.1	101.9	104.2	104.1	107.5
1939	99.2	102.6	102.9	105.7	104.1	98.2	102.0	105.0	105.5	106.7
1942	121.8	123.5	123.6	123.1	122.0	122.7	116.6	123.0	123.2	125.1
1945	152.1	151.1	151.9	141.9	143.7	155.3	131.8	147.8	141.3	142.7
1946	165.0	163.9	164.9	153.2	154.6	169.0	141.2	161.1	152.7	154.0
1947	201.9	198.6	198.6	176.7	179.8	206.7	161.2	192.3	175.8	176.9
1948	224.5	220.3	220.1	197.9	201.8	230.5	181.0	212.5	196.1	198.1
NEW YORK CITY AREA										
1926-29	133.3	138.4	131.9	122.8	120.4	137.5	113.1	127.4	123.2	125.3
1939	122.1	123.3	122.5	130.6	125.9	125.6	123.7	119.6	130.0	133.3
1942	140.7	139.1	138.2	137.9	135.6	145.0	128.5	132.6	137.1	139.3
1945	161.7	160.5	160.1	156.3	155.9	167.2	144.2	155.0	155.4	158.0
1946	182.4	181.8	181.1	177.2	174.6	188.1	158.6	177.4	174.8	179.0
1947	222.0	219.3	218.1	207.6	205.1	229.8	183.0	211.5	203.8	207.5
1948	251.6	250.1	249.0	239.4	236.8	260.5	212.2	240.7	236.5	242.2
PITTSBURGH AREA										
1926-29	113.2	118.8	112.8	111.2	107.1	115.4	89.6	112.2	104.6	112.9
1939	113.8	117.0	115.7	117.5	114.2	114.2	109.8	116.5	116.9	119.1
1942	132.7	131.1	130.6	126.0	124.4	133.9	115.4	128.6	124.8	127.6
1945	157.6	159.9	155.9	146.1	145.0	161.4	130.3	153.2	143.7	148.0
1946	169.5	169.0	168.0	156.6	155.3	173.5	140.1	166.4	153.2	158.9
1947	204.3	200.6	199.5	180.4	180.8	211.5	160.4	194.0	178.0	181.4
1948	235.2	231.2	229.6	207.3	207.9	243.0	183.2	222.2	203.5	210.1
ST. LOUIS AREA										
1926-29	118.6	121.1	115.7	109.9	108.8	121.8	103.3	111.7	107.7	109.3
1939	107.0	110.2	109.9	118.7	116.4	107.6	114.3	110.3	119.2	119.8
1942	123.3	124.5	124.1	126.9	125.9	126.3	120.9	122.3	126.9	128.6
1945	152.3	152.8	151.4	146.2	146.4	156.2	135.9	148.1	145.6	148.5
1946	167.4	167.1	166.2	159.1	158.9	171.7	145.3	154.8	158.1	161.1
1947	203.8	202.4	200.8	183.9	185.6	209.6	167.0	194.9	184.0	184.2
1948	231.2	227.9	227.2	207.7	210.3	239.7	190.0	220.3	208.1	210.0
SAN FRANCISCO AREA										
1926-29	87.7	93.7	90.4	97.5	96.5	86.1	95.5	95.5	91.8	99.0
1939	99.2	105.7	104.5	117.4	114.4	97.6	114.9	107.4	116.5	121.9
1942	120.1	123.6	123.4	127.5	127.5	121.1	127.2	123.7	130.8	129.3
1945	144.3	146.2	146.8	144.5	146.1	147.2	141.9	145.3	147.9	146.8
1946	157.5	159.7	160.0	157.9	159.0	160.5	151.5	158.4	160.0	159.3
1947	191.6	193.1	193.0	183.7	186.1	196.1	174.8	189.3	203.9	208.9
1948	216.6	218.9	218.7	208.3	210.3	222.2	196.9	216.9	211.2	214.7
SEATTLE AREA										
1926-29	84.5	92.2	89.2	101.7	95.1	82.4	100.8	92.2	100.5	105.3
1939	96.7	104.4	103.8	119.2	114.9	94.4	115.1	108.3	118.7	125.9
1942	121.5	122.7	122.3	131.7	128.6	116.5	129.2	124.2	133.4	136.0
1945	143.7	148.6	148.2	151.7	150.5	143.6	147.0	148.7	154.5	156.8
1946	152.9	158.3	157.9	161.2	159.8	154.3	156.0	158.9	164.2	167.1
1947	188.1	193.1	192.9	188.5	188.8	182.3	177.3	193.1	192.2	193.1
1948	211.4	216.3	216.6	211.5	212.6	214.5	200.9	215.6	216.9	216.6
WASHINGTON, D. C.										
1926-29	106.6	107.7	107.9	107.1	105.9	106.0	104.0	108.0	106.4	108.4
1945	153.4	150.3	151.9	144.4	145.9	157.8	135.9	146.5	144.6	143.5
1946	168.5	166.2	167.1	157.1	158.2	173.6	145.2	162.6	157.2	156.6
1947	204.2	200.0	200.0	178.9	182.9	210.3	166.9	193.7	181.0	188.9
1948	225.3	221.2	221.2	199.7	203.2	231.8	186.0	213.0	200.1	199.5

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See page 92, Apr. 27, 1939 issue for 1913-1938 data of series for Atlanta, New York, St. Louis and San Francisco.

Current indexes are calculated upon an actual survey at source of local construction cost conditions. Material prices used are those paid by contractors to material dealers. Labor rates are current rates paid by contractors—certain corrections being made in certain areas for labor efficiency and labor shortage. Index includes construction overhead, sales taxes, compensation insurance and social security. The indexes have been primarily engineered to use as local cost conversion factors to construction cost data released by the Boeckh organization. Complete index formula is available in published form in "Boeckh's Index Calculator Tables".

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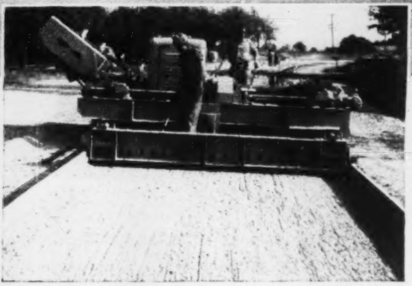

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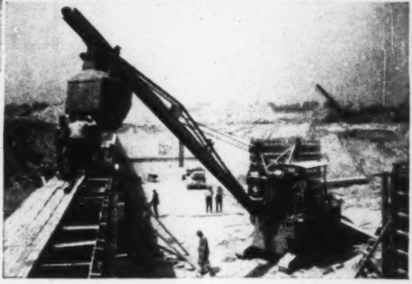
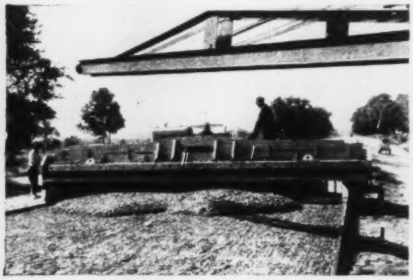
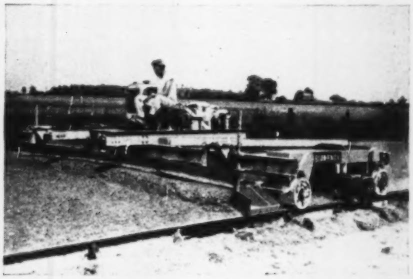


MULTIFOOTE Paving Mixer with the Elevating Boom is a dual-purpose, high-speed concrete construction tool that will eliminate extra equipment and high costs in the pouring of forms or give you big capacity for pavement too, without making any changes.



BLAW-KNOX CONCRETE PAVING SPREADER with its Automatic Transverse Blade will spread the harsh, dry mixes of two 34-E dual drum pavers no matter where the concrete is placed on the subgrade between the forms.



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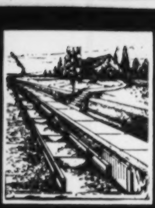
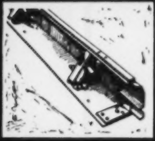
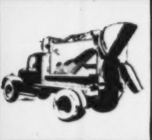


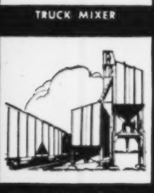
STEEL STREET FORMS



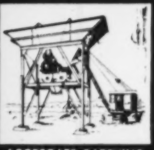
PAVING FORMS



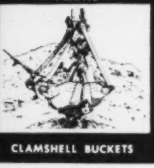
TRUCK MIXER



BULK CEMENT PLANTS



AGGREGATE BATCHING PLANTS



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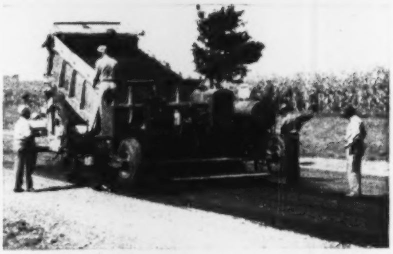

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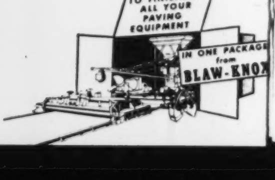
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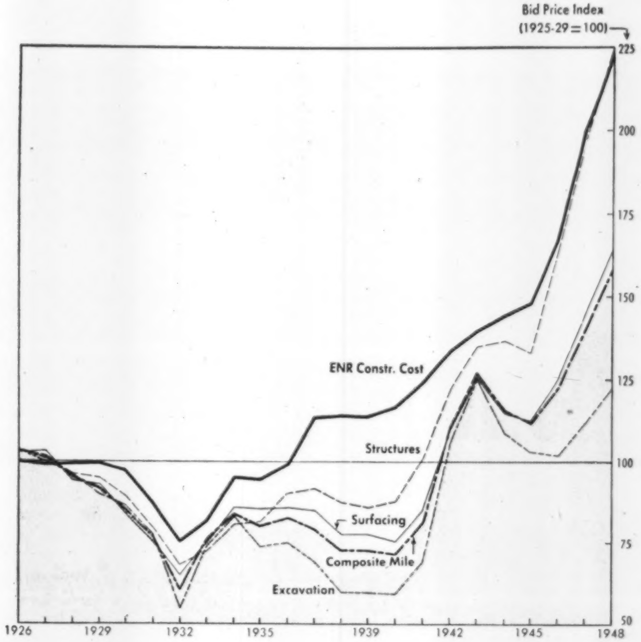


Roadbuilding Price Trends

The index of bid prices on a standard composite mile of highway, rose to an all time high in 1948, of 158.2, 12.6 percent above the 1947 average.

The Public Roads Administration Index, based on contractor's bids, shows that of the three components of highway construction, steel and concrete structures have gone up the most this year, 13.7 percent.

Surfacing costs are up 13.6 percent from 1947, and excavation costs have risen only 10.2 percent during the year.

Public Roads Administration Price Trend in Highway Construction for Composite Standard Mile

Year	Excavation[1] (17,491* cubic yards)		Surfacing[2] (3,726* square yards)		Structures				Com-posite mile
					Reinforcing steel (16,000* pounds)	Structural steel (4,325* pounds)	Structural concrete (68* cubic yards)	Combined	
	Bid price[3]	Sub-index	Bid price[3]	Sub-index	Bid price[3]	Bid price[3]	Bid price[3]	Sub-index	Index ¶
Base period, 1925 to 1929	$0.35†	100.0	$2.22†	100.0	$0.052†	$0.067†	$22.15†	100.0	100.0
1926	.36	103.7	2.29	103.1	.053	.074	22.76	103.7	103.4
1932	.18	55.0	1.44	64.8	.034	.046	15.33	68.0	61.0
1939	.21	59.8	1.73	77.8	.044	.059	19.13	85.9	72.6
1942	.37	105.5	2.44	109.7	.065	.090	26.16	122.3	109.9
1945	.36	102.6	2.48	111.8	.062	.077	31.62	132.5	111.7
1946	.36	101.9	2.78	125.3	.075	.113	38.79	164.7	122.9
1947	.39	111.2	3.20	144.2	.093	.132	45.84	196.9	140.4
1948	.43	122.5	3.63	163.8	.108	.158	51.00	223.9	158.2
1st Quarter	.43	122.5	3.34	150.6	.100	.145	50.46	215.7	150.5
2nd Quarter	.43	122.5	3.56	160.5	.106	.158	49.74	219.7	155.9
3rd Quarter	.44	125.4	3.71	167.3	.109	.159	50.89	224.6	161.0
4th Quarter	.42	119.7	3.92	176.7	.116	.169	52.89	235.7	165.3

[1] Common excavation plus other excavation items expressed as equivalent common excavation.

[2] Portland-cement concrete plus other surfacing items expressed as equivalent portland-cement concrete.

[3] Indexes and totals were calculated with the bid prices carried to one more decimal place than that to which they are shown in this table.

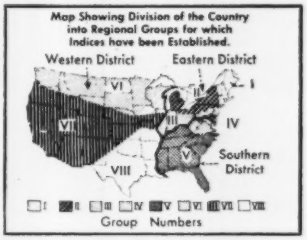
¶ Column showing amount of bid price times fixed quantity omitted in this table.

* Fixed quantities used for establishing composite mile for price trend.

† Fixed prices used for establishing composite mile index base.

Railroad Cost Indexes

Railroad Construction Cost Indexes released August 1, 1948 by Engineering Section, Bureau of Valuation, Interstate Commerce Commission, include items developed from analysis of major construction contracts over a period of 30 years. Indexes for material accounts are based on studies of carriers' returns to Valuation Order 14, joint studies made with various sub-committees of President's Conference Committee, well-known engineering and trade publications, contracts covering major construction projects and other information furnished by individual carriers.


Map Showing Division of the Country into Regional Groups for which Indices have been Established.
Western District
Eastern District
Southern District
I
II
III
IV
V
VI
VII
VIII
Group Numbers

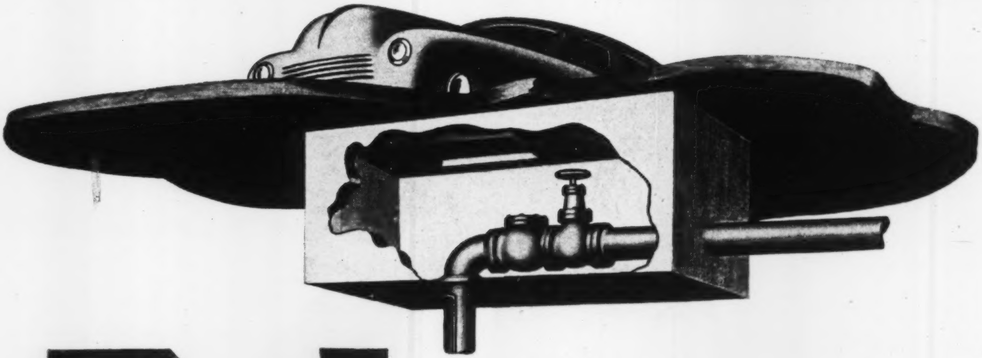
RR—Road Construction Costs (1910-14=100)

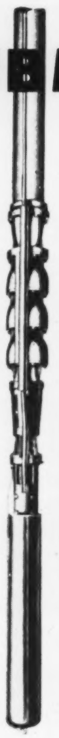
By Regions	Per Cent	1926	1932	1939	1945	1946	1947
to VIII	73.09	166	131	137	197	216	245
I	75.36	173	134	140	206	231	263
II	68.15	168	133	141	202	223	255
III	67.99	168	132	144	205	228	259
IV	70.49	163	126	131	195	212	239
V	76.66	164	129	136	195	215	242
VI	77.41	164	129	132	190	207	233
VII	75.62	166	131	133	188	202	232
VIII	78.15	167	133	140	198	215	242

Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.

Entire U. S., Regions I to VIII

By Accounts	1926	1932	1939	1945	1946	1947
Engineering	166	131	137	197	216	245
Other Rt. of Way Exp	159	121	135	201	236	238
Grading	153	106	90	144	148	154
Tunnels and Subways	178	119	140	236	260	304
Brdg., Culv. & Trestles	170	122	149	240	272	327
Elevated Structures	165	129	149	249	284	346
Ties	173	144	158	241	252	270
Rails	144	140	136	152	165	210
Other Track Material	177	163	167	176	190	217
Ballast	175	146	143	181	194	207
Trk. Laying & Surf	188	164	165	273	298	336
Fences, Snw. Sheds, Sgns.	178	147	141	189	206	242
Stat. & Off. Bldgs	184	141	166	244	291	333
Roadway Buildings	187	140	162	258	307	341
Water Stations	182	147	166	227	249	286
Fuel Stations	180	144	159	242	270	324
Shops & Eng. Houses	185	137	165	248	294	336
Grain Elevators	190	137	164	236	281	321
Storage Warehouses	189	137	166	253	300	340
Wharves & Docks	177	136	153	255	291	328
Coal & Ore Wharves	174	136	153	236	278	309
Tel. & Tel. Lines	157	121	129	173	192	239
Signals & Intrlocks	169	130	143	176	199	212
Power Plants	186	138	167	246	296	354
Power Trnsmissn. Sys	176	143	148	180	201	240
Misc. Structures	186	141	161	229	290	333
Roadway Machines	151	138	154	187	222	244
Roadway Small Tools	190	155	180	200	245	280
Public Impr.-Const	169	131	142	217	236	278
Shop Machinery	186	155	202	236	271	300
Power Plant Machnry	186	155	180	191	217	240





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install completely underground

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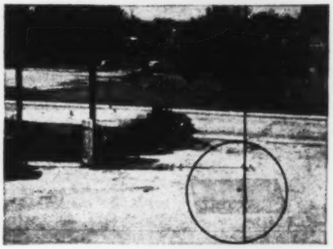
IF YOUR WATER SOURCE is difficult from an operating point of view; if a pump house will obstruct any of your routine operations or prove unsightly; if noise abatement is essential; if you might have losses from vandalism, let us plan a Submersible installation to fit your particular needs. Write today for a Byron Jackson booklet explaining the details of the exclusive Submersible design. Available in sizes from 7½ to 350 hp, capacities to 10,000 gpm at heads up to 1500 feet.



Actually, there's an active pump at this intersection

This Submersible has been in constant operation since installation. Delivers 950 gpm against a total head of 240 feet.

Byron Jackson Co.

Established 1872

LOS ANGELES 54, CALIFORNIA

Offices in Principal Cities

California Studies Highway Costs

Editor's Note—Because of the increasing cost of construction, California highway officials have found that, even with increased revenues, their construction program is not keeping up with highway deficiencies. Initial results of an intensive study were published by Richard H. Wilson, assistant state highway engineer; Henry C. McCarty, office engineer; and Richard R. Norton, assistant office engineer, in the January-February issue of *California Highways & Public Works.* Here is an abstract:

In attempting to answer the question "What effect is inflation having upon California's highway construction program?," one of the primary considerations of California Highway Department officials was a study of the prices charged for construction by contractors. This has resulted in the development of a California highway construction price index (Table I).

This index is based on weighted contract prices of eight major bid items representative of the majority of work on state highway contracts. The year 1940 was selected as the base and assigned an index number of 100.

The state price index indicates that there has been an increase of 116 percent in the cost of construction since 1940. (It indicates a minor decline for the last half of 1948.)

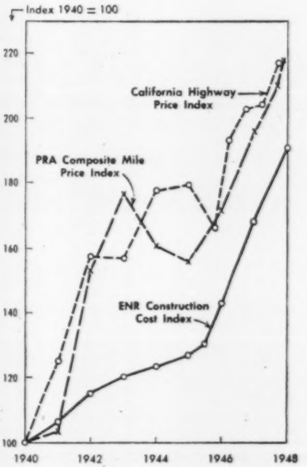
Comparing the California price index with the Public Roads Administration composite mile index and the ENGINEERING NEWS-RECORD construction cost index (Fig. 1), it can be seen that the California index is in line with the others. Because the ENR index does not reflect such intangibles as labor productivity and "gray market" materials prices, it is somewhat lower than the California and the PRA figures. However, the trend shown by all three is that costs were increasing at a faster rate than ever before, and no definite "leveling off" influence had materialized at the time of the California study. (This preceded the minor decline late in 1948.)

Another phase of the California study was comparison of the price charged by contractors with the cost incurred by them. Records of recently completed highway construction projects indicated that the cost to contractors is divided into: Labor —45 percent, materials—27 percent, equipment—23 percent, and overhead —5 percent.

Labor costs obtained from contractors, for example, show that in 1940 the average wage paid for an hour's labor (skilled and unskilled) on California highway construction was $1.01. For the first half of 1948 this figure had risen 98 percent, to $2. A conservative productivity factor of 75 percent was then used, to determine that labor costs for the first half of 1948 were 264 percent of the 1940 costs. Increases in other items were similarly estimated and the contractors' costs for 1948 were computed as shown in Table II.

Thus, the division estimates the costs to the contractors have increased 121 percent since 1940. This compares with the computed 116 percent increase in the price charged the state, indicating that contractors' prices are not out of line with their costs.

Another question studied was whether the large amount of highway construction now being placed under contract creates an inflationary pressure on the construction market. Apparently it does not. The 507 contractors prequalified by the division of highways have a total combined bidding capacity of $1,049,000,000. Yet on Nov. 1, 1948, there were only 283 contracts in force with a combined cost of $88,604,000—only 8.4 percent of the total bidding capacity.



The number of bidders on each project is another indication of sufficient contractor capacity: From July 1, 1947, to June 30, 1948, the department received an average of 5.6 bids on each job as is shown in Table III. The general trend is toward greater competition on larger projects than on smaller ones, despite the occasional proposal that contract prices could be reduced by splitting up large projects into smaller units.

Table I—California Highway Construction Price Index as Developed From Average Contract Prices

	Roadway Excavation (cu. yd.)	Crusher Run Base (tons)	Plant Mix Surfacing (ton)	Asphalt Concrete Pavement (ton)	PCC Pavement (cu. yd.)	PCC Structures (cu. yd.)	Bar Reinforcing Steel (lb.)	Structural Steel (lb.)	Calif. Hwy. Construction Price Index
1940	$0.22	$1.54	$2.19	$2.97	$7.68	$18.33	$0.040	$0.083	100.0
1941	0.26	2.31	2.84	3.18	7.54	23.31	0.053	0.107	125.0
1942	0.35	2.81	4.02	4.16	9.62	29.48	0.073	0.103	157.5
1943	0.42	2.26	3.71	4.76	11.48	31.76	0.059	0.080	156.4
1944	0.50	2.45	4.10	4.50	10.46	31.99	0.054	0.132	177.8
1945	0.51	2.42	4.20	4.88	10.90	37.20	0.059	0.102	179.5
Jan.-June. 1946	0.41	2.31	4.00	4.54	9.85	37.38	0.060	0.099	166.1
Jul.-Dec. 1946	0.39	2.27	4.12	5.04	12.39	49.84	0.079	0.142	193.2
Jan.-Jun. 1947	0.48	2.62	4.52	6.46	12.41	47.03	0.080	0.133	202.5
July.-Dec. 1947	0.54	2.39	4.02	6.48	11.58	50.15	.089	0.123	204.1
Jan.-Jun. 1948	0.56	2.45	4.42	4.91	13.37	49.51	.094	0.145	216.8
Jul.-Dec. 1948	0.52	2.64	4.80	7.00	13.77	49.10	.103	0.131	216.1
Quantity, year ending Jun. 30, 1948 (000 omitted)	15,697	682	1,501	34	209	164	27,305	36,414	.....

Note: Average prices computed by dividing total cost of an item for period by total quantity for that period. Price index for each period computed by extending total quantities for year ending June 30, 1948 by average prices and dividing by extension for 1940 (base year).

Table II—Contractors' Cost Index

Item	Percent of Item in Total Construction Cost	Present Cost of Item Compared to 1940 = 100	Portion of Cost Index
Labor	45	264	118.80
Materials	27	183	49.41
Equipment	23	188	43.24
Overhead	5	200	10.00
1948 Contractors' Cost Index			221.45

Table III—Contract Data Year Ending June 30, 1948

Size of contract	Average Number of Bids	Number of Prequalified Contractors
Over $1,000,000	7.4	137
$500,000 to $1,000,000	7.0	187
$250,000 to $500,000	7.4	
$100,000 to $250,000	6.6	347*
$50,000 to $100,000	5.2	382*
Up to $50,000	4.5	507
All projects	5.6	1560

* $125,000-$250,000 and $50,000 to $125,000.

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Construction Materials Prices in 20 Cities

Market quotations on construction materials reported monthly by ENR correspondents

	CEMENT, Bulk, per bbl CL lots. Incl Dealer Comn. fob city			SAND, per ton Truck lots or over fob city			CONCRETE, READY MIXED 1:2:4, over 50 cy per cy, delivered			BRICK, Clay Backing 3 x 4 x 8¼ in per M, CL lots fob city		
	1948		1949	1948		1949	1948		1949	1948		1949
	Low	High-Dec.	Mar.	Low	High-Dec.	Mar.	Low	High-Dec.	Mar.	Low	High-Dec.	Mar.
Average	2.67	2.96	2.98	1.83	1.98	2.01	9.56	10.21	10.26	24.41	27.34	27.44
Atlanta	2.82	3.05	3.05	1.75	1.75	1.75	11.00	11.00	11.00	24.00	25.00	25.00
Baltimore	2.66	3.06	3.06	1.60	1.95	1.95	8.55	9.85	9.85	27.00	32.00	32.00[f]
Birmingham	2.45	2.74	2.74	1.63	1.66	1.66[f]	6.95	7.75	7.75	20.00	20.00	20.00
Boston	3.08	3.65[b]	3.44	2.00	2.50	2.50[e,f]	9.40	10.50	10.50[k]	20.00	32.00	32.00
Chicago	2.59	3.00[c]	2.59	2.85	3.20	3.20	......	......	......	20.00	21.00	21.00[f,p]
Cincinnati	2.82	2.94	3.08	1.75	1.75	1.75[f]	9.00	10.40	10.60[l]	33.00	34.00	34.00
Cleveland	2.54	2.82	2.82	1.25	1.55	1.55[g]	10.40	11.80	11.80[n]	25.50	28.50	28.50[f]
Dallas	2.47	2.52	2.52	1.75	1.75	1.75	8.85	8.85	9.30	18.00	18.75	18.75
Denver	3.02	3.29	3.29	1.15	1.15	1.15	9.65	9.65	9.65	28.50	30.00	32.00
Detroit	2.49	2.92	2.97	2.75	3.00	3.00[f]	9.15	9.60	9.60	27.00	30.00	30.00
Kansas City	2.63	2.99	2.99	1.40	1.65	1.65[f]	9.60	9.85	10.65[m]	16.00	16.00	16.00
Los Angeles	3.00	3.34	3.42	1.72	1.72	1.72[f]	9.39	10.78	10.28[k]	20.00	20.00	20.00
Minneapolis	2.80[a]	3.00[a]	3.03[a]	1.20	1.35	1.35[f,i]	9.65	10.70	10.70[i]	23.50	30.00	30.00
New Orleans	2.33	2.75	2.75	1.67	1.82	1.82	10.65	10.65	10.65	22.50	29.00	29.00
New York	Bulk not quoted			1.30	1.45	1.45[e,h]	9.90	10.50[r]	10.30[o]	28.00	33.00	33.00
Philadelphia	2.47	3.10	3.14	2.05	2.05	2.05[f]	9.25	9.85	9.85	24.75	27.00	27.00
Pittsburgh	2.41	3.15[d]	3.10	2.35	2.35	3.00[f]	10.85	11.50	11.50	26.00	26.00	26.00
St. Louis	2.61	2.75	2.75	2.125	2.20	2.20[f,j]	10.15	10.40	10.40	28.50	32.50	32.50
San Francisco	2.64	2.98	2.98	1.81	1.94	1.94	9.92	10.75	10.75[n]	27.50	30.00	30.00[q]
Seattle	2.80	2.95	2.95	2.50	2.75	2.75[e,f,j]	9.00	9.75	9.75[j]	28.50	32.00	32.00

CEMENT: [a] CL price from Cement Co. Dealers sell only LCL. [b] Dec. 3.40. [c] Dec. 2.59. [d] Dec. 3.10.
SAND, READY MIXED CONCRETE BRICK: Footnotes shown once apply to all 3 series of prices. [e] Per cu. yd. [f] Delivered. [g] fob plant. [h] Barge lots asd. [i] 5% cash disc. [j] 2% cash disc. [k] 50c. cash disc. [l] Up to 500 cy. [m] 25 cy. plus. [n] 10–100 cy. [o] 7–9 mi. zone. [p] 3¼ x 4 x 8¼. [q] 2¼ x 8¼ x 4". [r] Dec. 10.30.

	STRUCTURAL CLAY TILE Partition, Scored, 3 x 12 x 12 per M 2000 pieces or over delivered		
	1948		1949
	Low	High-Dec.	Mar.
Average	120.23	129.26	130.71
Atlanta	......	......	......
Baltimore	120.00	120.00	170.00
Birmingham	97.50	97.50	97.50
Boston	105.00	145.65	145.65[a]
Chicago	115.00	115.00	115.00
Cincinnati	155.00	170.00	170.00
Cleveland	107.50	118.00	118.00
Dallas	......	......	......
Denver	......	......	......
Detroit	117.08	130.00[i]	117.08
Kansas City	......	......	115.50
Los Angeles	Not Used		......
Minneapolis	144.00	152.00	152.00
New Orleans	160.00	160.00	160.00
New York	103.90	112.20	118.00
Philadelphia	112.10	112.10	112.10
Pittsburgh	98.50	98.50	98.50
St. Louis	106.92	126.00	120.00
San Francisco	124.00	132.00	132.00
Seattle	137.00	150.00	150.00

	LUMBER, No. 2 Common or better, 2 x 4 s4s							
	Short Leaf Yellow Pine				Douglas Fir			
	1948			1949	1948			1949
	Jan.	High	Dec.	Mar.	Jan.	High	Dec.	Mar.
Average	89.49	92.43	88.88	78.95	97.34	101.92	95.61	90.87
Atlanta	70.00	70.00	60.00	60.00[b]	96.50	96.50	......	......[b]
Baltimore	96.00	96.00	92.00	92.00	112.30	115.00	115.00	115.00
Birmingham	87.00	87.00	75.00	73.00[b]	92.00	92.00	75.00	77.00[b]
Boston	88.00	92.00	85.00	83.00[c]	95.00	102.00	92.00	92.00
Chicago	93.00	93.00	80.00	80.00[d]	100.00	100.00	92.00	86.00[d]
Cincinnati	95.00	105.00	105.00	90.00	......	......	......	90.00
Cleveland	97.00	97.00	73.00	71.00	......	......	......	......
Dallas	61.00	61.00	61.00	61.00[b]	......	......	......	......
Denver	......	......	......	......	96.50	113.00	110.00	97.00
Detroit	90.00	90.00	73.00	72.00	92.00	94.00	85.00	88.00
Kansas City	100.00	101.50	101.50	......[e]	100.00	106.50	106.50	89.75[g]
Los Angeles	......	......	......	......	103.00	103.00	88.00	76.00[h]
Minneapolis	......	......	......	......	108.00	113.00	111.00	105.00[e]
New Orleans	84.00	84.00	70.00	70.00[b]	70.00	71.00	71.00	71.00[b]
New York	96.25	107.50	85.00	81.25[d]	125.00	125.00	101.25	97.50[d]
Philadelphia	105.00	105.00	99.75	95.00	115.00	115.00	115.00	110.00
Pittsburgh	80.10	82.50	82.50	82.50[b]	83.00	105.60	105.00	105.00
St. Louis	100.00	115.00	99.50	94.50[e]	120.00	130.00	120.00	115.00[e]
San Francisco	......	......	......	......	76.50	81.00	73.00	68.00[h]
Seattle	......	......	......	......	70.00	70.00	70.00	62.50[b]

Footnotes each group apply to all three price series. [a] Fob. [b] Fob. mill. [c] Norway pine. [d] Delivered. [e] Delivered LCL lots. [f] No. 1 com. [g] Retail LCL. [h] Yard. [i] Dec. 117.08 (Applies Detroit High-Dec. series only.)

Basic Building Materials Prices

Average yearly prices at New York, except steel and cast iron pipe

Year	Brick Common per M	Cement per bbl.	Lime per bbl.	Pine per M ft. BM	Steel Shapes per cwt.	Cast Iron Pipe per ton
1874	$7.41	$1.48R	$1.50a	$26.00d	....	$43.76h
1870	6.65	2.25R	.95a	21.75d	....	24.65h
1907	6.16	1.55	.95a	30.50d	1.75	31.52i
1913	6.75	1.18	.915a	25.04e	1.50	21.96i
1929	11.71	2.23	2.25b	64.50f	1.92	36.66i
1932	9.75	1.62	2.25b	39.91f	1.56	30.58i
1938	13.10	2.12	2.80b	59.33f	2.18	48.33i
1939	13.46	2.20	2.80b	64.35f	2.10	46.75i
1942	14.17	2.20	2.80b	85.61f	2.10	49.00i
1947	26.38	3.46	24.34c	115.83g	2.61	75.46i
1948	**30.33**	**4.05**	**26.32c**	**114.38g**	**2.98**	**89.58i**

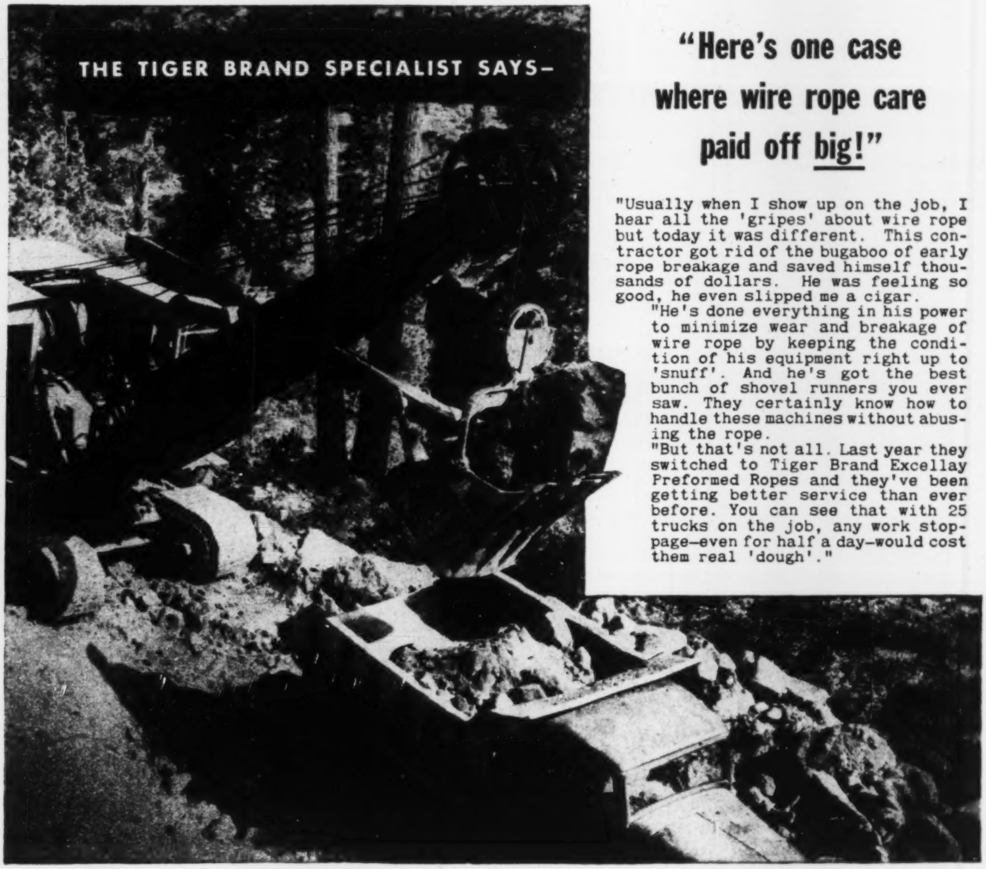
BRICK: wholesale, fob; CEMENT: net, delivered **R** Rosendale, rest Portland; LIME: **a** common lump, wholesale, fob, 180 lb., net, **b** 280 lb., **c** common hydrated, delivered, per ton (40 bags of 50 lb. ea) no longer quoted per bbl.; LUMBER: No. 1 common, rough, **d** 1-in. yellow pine, wholesale at dock, **e** 3-in. LLYP, **f** 3 x 12 LLYP from Lumber Trade Jl., **g** 3 x 12 SLYP (LLYP out of market); STEEL: fob Pittsburgh; CAST IRON PIPE: fob Delaware River foundries, **h** all classes bell and spigot, **i** 6-in. and larger, Cl. B or heavier bell and spigot.

Index Wholesale Price Bu. of Labor Statistics

Building Materials

(1926=100)	1929	1932	1939	1942	1946	1947	1948
All	**95.4**	**71.4**	**90.5**	**110.2**	**132.2**	**179.7**	**198.6**
Brick and tile	94.3	77.3	91.4	98.0	123.0	139.6	155.7
Cement	91.8	77.2	91.3	94.0	104.1	115.5	130.4
Lumber	93.8	58.5	93.2	133.0	177.5	276.0	311.2
Paint	94.9	71.1	82.8	100.3	118.3	165.5	159.6
Plumb & heat	95.0	66.8	79.2	95.4	103.5	125.4	147.6
Struc. steel	98.1	80.9	107.3	107.3	118.5	134.3	163.7
Other	97.7	79.5	90.3	103.5	117.9	147.1	167.6

BLS, late in 1948, launched a new weekly wholesale price index covering building materials predominant in housing cost. This has fewer components than the monthly index reported above but agreed on trend.



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UNITED STATES STEEL

Construction Wage Rates and Trends

ENR Construction Wages
20-cities average

SKILLED LABOR †* (Dollars per Hour)

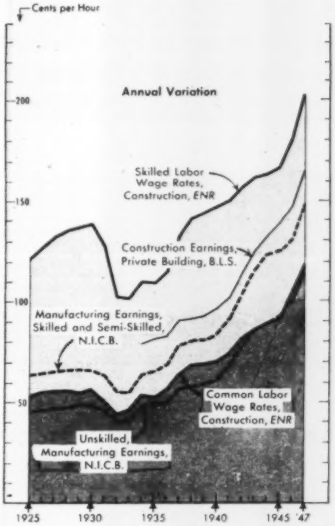
	1926	1932	1939	1942	1945	1946	1947	1948	1949
J	1.24	1.15	1.43	1.53	1.64	1.70	1.90	2.14	2.35
F	1.24	1.11	1.43	1.54	1.64	1.73	1.92	2.15	2.35
M	1.24	1.11	1.43	1.54	1.64	1.74	1.92	2.15	2.38
A	1.25	.95	1.44	1.54	1.65	1.76	1.93	2.17	....
M	1.26	.96	1.44	1.54	1.65	1.77	1.94	2.18	....
J	1.27	.99	1.44	1.55	1.66	1.80	2.02	2.25	....
J	1.27	1.00	1.44	1.56	1.66	1.82	2.07	2.29	....
A	1.28	.98	1.44	1.59	1.67	1.83	2.08	2.30	....
S	1.28	.99	1.44	1.59	1.67	1.84	2.10	2.32	....
O	1.29	.98	1.44	1.59	1.67	1.85	2.13	2.33	....
N	1.29	.97	1.46	1.60	1.68	1.86	2.13	2.34	....
D	1.29	.98	1.46	1.60	1.68	1.87	2.14	2.35	....
Av.	**1.27**	**1.02**	**1.44**	**1.56**	**1.66**	**1.80**	**2.02**	**2.25**	
M1	.651	.559	.81	1.044	1.248	1.321	1.478	1.618♯	

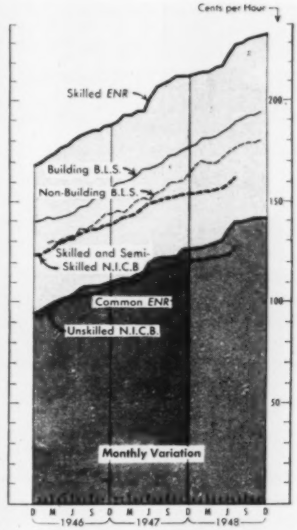
COMMON LABOR * (Dollars per Hour)

	1926	1932	1939	1942	1945	1946	1947	1948	1949
J	.54	.452	.682	.776	.891	.952	1.110	1.272	1.417
F	.54	.452	.680	.780	.891	.968	1.118	1.272	1.417
M	.543	.436	.680	.780	.895	.988	1.118	1.283	1.424
A	.543	.412	.683	.788	.904	1.004	1.133	1.287	....
M	.55	.411	.682	.788	.909	1.018	1.140	1.300	....
J	.55	.412	.684	.796	.916	1.034	1.185	1.352	....
J	.553	.411	.684	.802	.916	1.058	1.233	1.394	....
A	.555	.422	.685	.823	.916	1.071	1.237	1.394	....
S	.555	.431	.685	.823	.917	1.072	1.237	1.401	....
O	.55	.431	.685	.826	.917	1.073	1.263	1.413	....
N	.555	.426	.685	.832	.917	1.078	1.265	1.413	....
D	.555	.427	.685	.832	.938	1.085	1.272	1.413	....
Av.	**.548**	**.4269**	**.683**	**.804**	**.910**	**1.033**	**1.193**	**1.350**	
M2	.461	.401	.594	.774	.917	1.015	1.147	1.265♯	

† ENR Skilled average represents rates for bricklayers, carpenters, ironworkers.
M1 NICB Skilled and Semi-skilled Manufacturing.
M2 NICB Unskilled Manufacturing.
* Reported by ENR each month.
♯ Value for July 1948; series then discontinued.

The ENR 20-cities wage average is based on straight time hourly rates for skilled and unskilled construction labor. BLS wage trends also shown in chart are hourly earnings for both building and non-building workers.





B.L.S. Consumers' Price Index (1935-1939 = 100)

	1926	1932	1939	1942	1945	1946	1947	1948
January	.....	.....	.....	112.0	127.1	129.9	153.3	168.8
February	.....	.....	.....	112.9	126.9	129.6	153.2	167.5
March	.....	.....	99.2	114.3	126.8	130.2	156.3	166.9
April	.....	.....	.....	115.1	127.1	131.1	156.2	169.3
May	.....	.....	.....	116.0	128.1	131.7	156.0	170.5
June	124.1	101.1	98.2	116.4	129.0	133.3	157.1	171.7
July	.....	.....	.....	117.0	129.4	141.2	158.4	173.7
August	.....	.....	.....	117.5	129.3	144.1	160.3	174.5
September	.....	.....	101.3	117.8	128.9	145.9	163.8	174.5
October	.....	.....	.....	119.0	128.9	148.6	163.8	173.6
November	.....	.....	.....	119.8	129.3	152.2	164.9	172.2
December	124.5	97.3	100.1	120.4	129.9	153.3	167.0	171.4

Yearly Average WAGES OF SIX BUILDING TRADES in Seven Cities

Bricklayers

	Boston	New York	Chicago	Birmingham	St. Louis	San Francisco	Seattle
1926	$1.35	$1.645	$1.56	$1.25	$1.75	$1.25	$1.375
1932	1.105	1.47	1.40	.825	1.50	1.175	.975
1939	1.50	1.893	1.70	1.50	1.50	1.75	1.60
1942	1.573	2.00	1.721	1.75	1.563	1.771	1.715
1945	1.625	2.00	1.84	1.75	1.84	1.875	1.845
1946	1.883	2.25	1.96	1.89	1.975	2.006	1.937
1947	2.085	2.646	2.117	2.037	2.25	2.233	2.181
1948	2.35	2.94	2.32	2.25	2.60	2.67	2.37

Common Building Laborers

	Boston	New York	Chicago	Birmingham	St. Louis	San Francisco	Seattle
1926	$0.77	$1.07	$0.88	$0.625	$1.20	$0.8125	$1.00
1932	.70	1.00	.825	.40	1.00	.70	.80
1939	.85	1.14	1.025	.40	1.00	1.25	1.15
1942	1.00	1.214	1.063	.65	1.075	1.25	1.265
1945	1.028	1.215	1.215	.641	1.056	1.072	1.172
1946	1.1667	1.233	1.25	.65	1.00	1.1406	1.2371
1947	1.328	1.438	1.417	.775	1.288	1.325	1.47
1948	1.487	1.616	1.616	.908	1.437	1.465	1.668

Carpenters

	Boston	New York	Chicago	Birmingham	St. Louis	San Francisco	Seattle
1926	$1.20	$1.45	$1.39	$0.6575	$1.50	$1.00	$1.125
1932	1.04	1.33	1.40	.60	1.275	.96	.695
1939	1.375	1.75	1.625	1.125	1.25	1.25	1.25
1942	1.417	1.85	1.656	1.167	1.50	1.385	1.415
1945	1.50	1.85	1.756	1.281	1.62	1.50	1.55
1946	1.625	2.10	1.9083	1.4479	1.8667	1.7083	1.6371
1947	1.838	2.467	2.067	1.573	2.044	1.883	1.881
1948	2.03	2.73	2.27	1.73	2.26	2.08	2.065

Plasterers

	Boston	New York	Chicago	Birmingham	St. Louis	San Francisco	Seattle
1926	$1.50	$1.75	$1.50	....	$1.75	$1.50	$1.375
1932	1.625	1.50	1.375	$1.25	1.50	1.10	1.20
1939	1.625	2.00	1.70	1.00	1.58	1.60	1.60
1942	1.65	2.00	1.825	1.50	1.75	1.681	1.715
1945	1.667	2.00	1.844	1.61	1.75	1.75	1.85
1946	1.8611	2.1875	1.95	1.65	1.90	1.9375	1.9371
1947	2.042	2.75	2.131	1.906	2.25	2.229	2.17
1948	2.395	3.08	2.33	2.116	2.35	2.25	2.37

Structural Ironworkers

	Boston	New York	Chicago	Birmingham	St. Louis	San Francisco	Seattle
1926	$1.23	$1.60	$1.405	$1.25	$1.50	$1.125	$1.125
1932	1.205	1.675	1.375	.75	1.50	1.13	1.13
1939	1.60	1.925	1.70	1.25	1.75	1.50	1.50
1942	1.588	2.00	1.725	1.50	1.75	1.625	1.615
1945	1.666	2.00	1.805	1.594	1.79	1.75	1.745
1946	1.7875	2.25	1.9033	1.625	1.9708	1.875	1.7954
1947	1.921	2.563	2.117	1.788	2.125	2.083	2.043
1948	2.283	2.98	2.32	2.05	2.35	2.275	2.265

Common Laborers

	Boston	New York	Chicago	Birmingham	St. Louis	San Francisco	Seattle
1926	$0.615	$0.815	$0.86	$0.30	$0.6525	$0.525	$0.5675
1932	.575	.645	.665	.225	.56	.56	.48
1939	.725	.912	1.025	.35	.663	.65	.908
1942	.879	.991	1.056	.6375	.8875	.8875	1.058
1945	1.00	1.06	1.16	.65	1.00	1.00	1.145
1946	1.1667	1.2042	1.25	.65	1.00	1.1406	1.2433
1947	1.338	1.438	1.417	.875	1.325	1.325	1.363
1948	1.49	1.63	1.62	.96	1.57	1.46	1.67

Complete record by years in ENR, May 27, 1948.

Index of Union Hourly Wage Rates in Each Building Trade (1939 = 100)

U. S. Bureau of Labor Statistics, Wage Analysis Branch

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians (Inside Wiring)	Glaziers	Lathers	Painters	Plasterers	Plumbers & Gas Fitters	Sheet Metal Wrokers	Steam & Sprinkler Fitters	Stonemasons	Structural Ironworkers	Building Laborers	Hod Carriers
1907...	29.3	29.7	27.3	37.7	29.8	34.5	27.9	.....	.....	26.2	37.3	33.3	30.6	30.1	33.9	27.9	30.8	30.3
1913...	36.1	36.9	31.8	41.5	36.8	38.0	33.8	.....	34.6	35.5	39.3	37.9	35.6	35.0	36.7	37.3	34.2	31.8
1926...	88.3	88.7	84.9	94.1	88.5	86.6	81.5	80.7	83.0	90.9	92.4	83.9	86.3	84.9	92.7	81.1	86.9	85.5
1930...	97.0	97.5	93.3	101.8	96.9	95.4	90.0	92.6	89.6	100.6	98.1	91.5	94.7	93.5	99.1	92.5	92.9	94.9
1932...	83.1	83.6	79.2	87.0	79.6	83.6	87.9	78.0	80.0	85.3	81.4	80.5	83.4	81.0	88.4	81.0	78.7	.....
1938...	99.3	99.3	99.2	99.5	99.8	99.6	99.5	99.3	96.8	99.2	99.2	99.1	98.6	99.3	99.7	98.9	99.4	99.7
1942...	111.9	110.9	117.5	108.3	112.1	110.8	113.5	108.8	109.1	110.5	105.0	110.5	116.0	109.3	108.0	108.7	119.6	115.7
1946...	129.3	126.8	146.3	125.6	129.7	128.2	124.9	123.4	124.2	127.3	119.0	123.2	133.0	124.6	126.5	121.4	152.2	141.7
1947...	147.9	144.6	171.1	165.6	149.6	144.3	140.9	141.9	144.4	142.4	139.3	142.9	146.8	139.1	145.0	136.3	177.9	165.6
1948...	163.5	159.4	192.7	165.6	164.7	161.1	154.4	155.5	157.8	154.4	148.2	158.2	164.4	154.3	166.0	151.9	200.8	185.5

Index of Union Hourly Wage Rates in Each Building Trade (1939 = 100)

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians (Inside Wiring)	Glaziers	Lathers	Painters	Plasterers	Plumbers & Gas Fitters	Sheet Metal Workers	Steam & Sprinkler Fitters	Stonemasons	Structural Ironworkers	Building Laborers	Hod Carriers
1907...	124.3	123.8	126.1	122.9	121.0	122.7	124.2	.....	.....	131.1	125.8	120.6	117.0	120.3	118.4	121.3	121.6	118.9
1913...	118.2	118.0	118.3	114.9	115.6	119.8	120.7	.....	121.8	125.9	124.3	119.2	114.9	118.0	115.7	114.1	118.3	116.0
1926...	114.9	115.1	113.9	113.3	113.5	113.4	115.9	116.5	118.9	120.7	118.2	116.5	111.8	114.4	114.5	112.8	112.1	113.9
1930...	109.8	110.0	109.0	107.1	109.4	108.1	109.9	112.4	110.4	115.1	113.0	109.9	106.9	108.5	107.1	108.8	110.0	106.9
1932...	106.5	106.6	105.7	103.1	105.0	105.6	106.2	107.9	109.3	114.2	110.0	108.0	103.6	106.4	104.8	104.8	104.9	104.0
1938...	100.2	100.1	100.2	100.0	100.0	100.0	100.3	100.2	100.8	110.4	100.0	99.7	100.0	99.6	100.0	100.1	100.1	100.3
1942...	101.1	101.8	98.8	100.8	100.8	100.6	104.6	102.0	102.5	106.5	102.0	99.9	100.9	102.2	100.2	101.1	98.8	98.6
1946...	100.2	101.1	97.4	100.3	100.3	100.4	100.5	102.0	102.2	106.1	104.1	98.3	100.8	101.3	100.0	101.1	97.2	96.9
1947...	100.1	100.9	97.4	99.8	100.2	100.0	100.5	103.5	102.2	106.2	103.0	97.3	100.1	101.3	99.3	101.1	97.2	96.4
1948...	100.1	101.0	97.3	100.5	100.2	100.0	100.5	103.5	98.1	106.2	102.9	97.6	100.1	101.3	101.0	101.1	97.2	96.4

Canadian Wage Rates for 8 Building Trades in 11 Cities

Rates from Dept. of Labour, and Canadian Construction Association

	Bricklayers			Carpenters			Electricians			Painters		
	1939	1947	1948	1939	1947	1948	1939	1947	1948	1939	1947	1948
Halifax	$1.00	$1.33	$1.44	$.70	$1.11	$1.23	$.85	$1.23	$1.33	$.60	$.95	$1.10
Saint John	.90	1.35	1.45	.50-.60	.95	1.00	.50-.65	.95	1.10	.50-.55	.87	.96
Quebec	.75-.85	1.15	1.50	.55-.60	.95	1.00	.55-.65	.95	1.00	.50-.55	.90	.95
Montreal	.80-.90	1.40-1.75*	1.60	.70	1.06	1.25	.75	1.11	1.35	.66	.95-1.00	1.15
Toronto	1.00	1.60	1.75	.90	1.35	1.50	1.00	1.45	1.65	.75	1.15	1.25
Hamilton	.90	1.45	1.60	.75	1.25	1.40	.75	1.20	1.40	.65	1.05	1.10
Windsor	1.15	1.50	1.65	.95	1.35	1.50	1.15	1.50	1.65	.60-.65	1.10-1.25	1.20
Winnipeg	1.10	1.45	1.45	.85	1.25	1.35	.85	1.25	1.35	.70	1.10	1.15
Saskatoon	1.00	1.40-1.50	....	.50-.75	1.20-1.30	....	.70-.80	1.20	....	.50-.70	.90	....
Edmonton	1.10	1.60	1.75	.90	1.25	1.40	.85	1.265	1.27	.80	1.10	1.25
Vancouver	1.10	1.60	1.75	.75-.90	1.40	1.55	.75-1.00	1.50	1.70	.63-.80	1.20	1.35

*1.17 is the official union rate.

	Plasterers			Plumbers			Sheetmetal Workers			Labourers		
	1939	1947	1948	1939	1947	1948	1939	1947	1948	1939	1947	1948
Halifax	$.80	$1.21	$1.35	$.85	$1.19	$1.30	$.70	$.99	$1.10	$.30-.40	$.50-.70	$.72
Saint John	.90	1.35	1.35	.60-.70	1.05	1.20	.50-.65	.95	.90	.30-.40	.55-.65	.61
Quebec	.75	1.15	1.35	.55-.65	.95	1.00	.55-.65	.95	1.00	.40	.70	.75
Montreal	.80	1.40*	1.50	.75	1.40	1.45	.65-.75	1.06	1.25	.40	.70	.80
Toronto	.90	1.50	1.80	1.00	1.48	1.60	.93	1.46	1.65	.35-.50	.80-.95	.86
Hamilton	.90	1.45	1.50	.85	1.42	1.42	.75	.90-1.25	1.25	.35-.45	.65-.80	.80
Windsor	.90	1.40	1.55	1.00	1.50	1.65	.70-.85	1.35	1.50	.55	.80-.95	.96
Winnipeg	1.10	1.45	1.50	.95	1.35	1.50	.70	.95	.95	.40-.45	.70-.80	.75
Saskatoon	.75-1.00	1.00-1.25	....	1.00	1.35	....	.75-.90	.80-1.15	....	.30-.40	.65-.75	....
Edmonton	1.05	1.60	1.60	1.05	1.35	1.50	.90	1.30	1.45	.40-.50	.80	.90
Vancouver	1.00	1.475	1.75	1.00	1.35	1.65	1.00	1.48	1.65	.45-.50	.90-1.00	1.00

*$1.17 is the official union rate.

Note: Vacation Pay Assessments for above trades are as follows: Toronto—4% (except for painters and sheetmetal workers), Hamilton—2%, Windsor—2%, Winnipeg—2%, Saskatoon—4%, Edmonton—2-4%, and Vancouver—2½%.

Hourly wage rates in Canada increased 11.3 percent during 1948 over 1947 and closed the year 75.9 percent above 1939 unweighted average for 8 building trades in 8 cities. Cost of living increased 8.4 percent during 1948, and in December was 56.3 percent above the August, 1939 average. Since 1939 more continuous employment, up-grading, and overtime have raised earnings more than indicated by these wage increases reported by Dominion Bureau of Statistics and Canadian Construction Association.

Wage Rates per Hour New York City

	Carpenters	Bricklayers	Masons' Laborers	Common Laborers	Structural Iron-Workers
1874...	.23 (10 hrs.)	.43 (8 hrs.)	.18 (8 hrs.)	.14 (10 hrs.)	......
1890...	.43 (8 hrs.)	.47 (8 hrs.)	.28 (9 hrs.)	.14 (9 hrs.)	
1907...	.63	.70	.38	.22 (8 hrs.)	.60 (8 hrs.)
1913...	.63	.70	.38	.23	.63
1930...	1.65	1.93	1.03	1.03	1.93
1932...	1.33	1.47	1.00	.65	1.68
1938...	1.75 (7 hrs.)	1.89 (7 hrs.)	1.00	.91	1.93
1939...	1.75	1.89	1.03	.91	1.93
1942...	1.85	2.00	1.03	.95	2.00
1946...	2.10	2.25	1.23	1.20	2.25
1947...	2.47	2.65	1.44	1.44	2.56
1948...	2.73	2.94	1.62	1.63	2.98

Wage Rates per Hour Chicago (Cook County)

Chicago Builders Directory and Guide

	Bricklayers	Carpenters	Electrical Workers	Cement Finishers	Laborers
1908...	.625	.563	.623	.55	.35
1913...	.75	.65	.75	.65	.40
1926...	1.63	1.50	1.50	1.50	.90
1930...	1.70	1.63	1.70	1.63	.975
1932...	1.38	1.31	1.25-1.50	1.31	825
1938...	1.70	1.63	1.70	1.63	1.03
1939...	1.70	1.63	1.70	1.63	1.03
1942...	1.75	1.70	1.70	1.70	1.10
1946...	2.00	1.95	1.98	1.95	1.30
1947...	2.20	2.15	2.15	2.15	1.50
1948...	2.40	2.35	2.35	2.35	1.70

Mexico City Prices

In Pesos, F.o.b. City		Dec. '47	Dec. '48
Common Wages—Building (8 hr. day)	av. per hr.	$.57	$.57
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.75	.75
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	1.25	1.25
Bricklayers (8 hr. day)	av. per hr.	1.25	1.25
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Steel Shapes			
3"-15" x 12 meters	per ton	800.00	1,300.00
Reinforced Steel, Corr. Rods			
⅜" x 12 meters	per ton	1,000.00	1,140.00
½" x 12 meters	per ton	955.00	1,080.00
⅝" x 12 meters	per ton	940.00	1,056.00
¾" x 12 meters	per ton	940.00	1,020.00
⅞" x 12 meters	per ton	930.00	1,020.00
1" x 12 meters	per ton	925.00	1,020.00
Gravel, truck load of 3½ cu. meters			
Blue Gravel	per tr. load	33.00	30.00
Rose Gravel	per tr. load	32.00	32.00
Cement, Std. Port. (Tolteca)	per ton	115.00	115.00
Lumber			
Mex. Sacred Fir (Oyamel)	per M ft.	370.00	350.00
1st Class Pine	per M ft.	700.00	600.00
2nd Class Pine	per M ft.	500.00	500.00

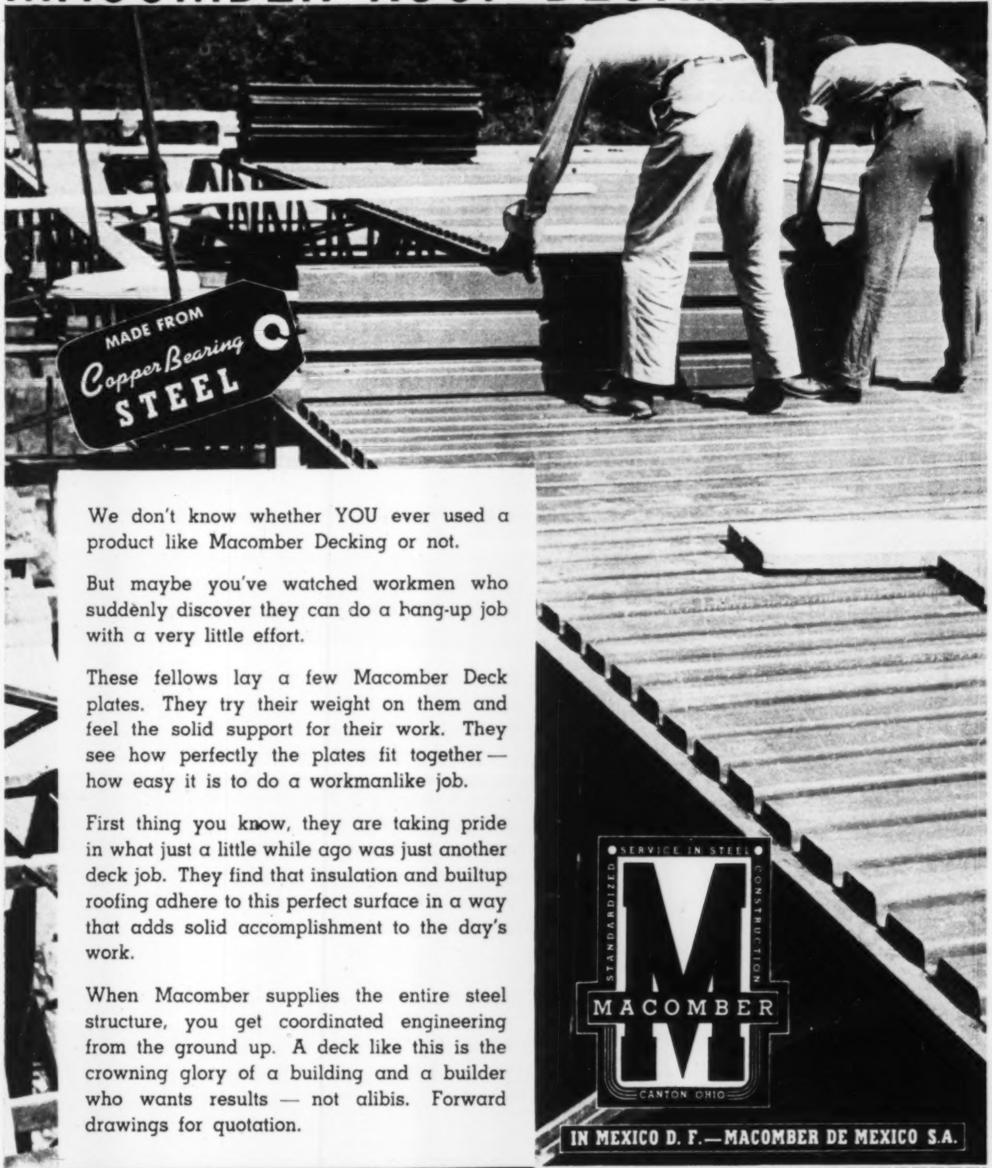
Average Earnings and Hours on Private Construction Projects

U. S. Bureau of Labor Statistics: Nov. 1948

U. S. Average	Average hourly earnings	Average weekly hours
Total building	**$1.937**	**36.7**
All building trades	2.014	37.4
Plumbing and heating	2.021	37.7
Painting and decoration	2.002	34.9
Electrical	2.200	39.4
Masonry	2.025	36.2
Plastering and lathing	2.240	34.7
Carpentry	1.841	37.1
Roofing and sheet metal	1.762	37.3
Excavation and foundation	1.777	38.7
Total non-building	**1.795**	**39.7**
Highway and street	1.685	37.6
Heavy construction	1.860	40.6
Other	1.723	39.3

MACOMBER ROOF DECKING

THE PERFECT SUPPORT FOR BUILTUP JOBS



We don't know whether YOU ever used a product like Macomber Decking or not.

But maybe you've watched workmen who suddenly discover they can do a hang-up job with a very little effort.

These fellows lay a few Macomber Deck plates. They try their weight on them and feel the solid support for their work. They see how perfectly the plates fit together — how easy it is to do a workmanlike job.

First thing you know, they are taking pride in what just a little while ago was just another deck job. They find that insulation and builtup roofing adhere to this perfect surface in a way that adds solid accomplishment to the day's work.

When Macomber supplies the entire steel structure, you get coordinated engineering from the ground up. A deck like this is the crowning glory of a building and a builder who wants results — not alibis. Forward drawings for quotation.

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CLIP THIS NOTICE and forward for your copy of new DECK CATALOG containing the new steel deck specifications. A MUST for your files. Ready shortly. Add your name and address.

STEEL JOISTS • LONGSPANS • ROOF TRUSSES • STEEL SIDING

FORT PITT BRIDGE meets an "IMPOSSIBLE SCHEDULE"

Let's look at this "impossible schedule"—ground was broken for the main building, covering nearly four acres on February 13, 1948—and it *was ready for occupancy* on July 26, 1948. This record-shattering construction achievement for the Harry Ferguson, Inc. Tractor Assembly Plant and Power House—for which Fort Pitt Bridge supplied the Structural Steel—is proof of the importance of progressive architectural planning, modern engineering "know-how," owner's foresight, contractor's ability to produce and *suppliers' integrity.*

JAHR and LYMAN
Architects—Engineers
DONALD C. ANDERSON
Assoc. Architect
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FORT PITT BRIDGE WORKS

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BRANCH OFFICES
New York, N.Y....441 Lexington Ave.
Columbus, Ohio, Huntington Bank Bldg.
Cleveland, Ohio.......Bulkley Building
Detroit, Michigan....New Center Bldg.

"STEEL PERMITS STREAMLINING CONSTRUCTION WITH SAFETY, ENDURANCE AND ECONOMY"

Building Trades Wage Rates—8-Hour Day

(Prevailing February 15, 1949.—Compiled by Engineering News-Record)

City and State	Carpenters	Bricklayers	Structural Ironworkers	Common Labor—Buildings	Common Labor—Heavy Constr.	Stonemasons	Mason's Helpers	Plasterers	Mosaic and Terrazzo	Tile Layers	Cement Finishers	Lathers	Electric Workers (Inside)	Painters	Glaziers	Plumbers	Steamfitters	Roofers	Waterproofers	Sheet Metal Workers	Welders	Hoisting Eng.—1-Drum	Hoisting Eng.—2-Drum	Tractor Operator (Over 30.hp.)	Power Shovel Operator	Truck Drivers (Over 1½ Tons)
Anderson, Ind	$1.95	$2.75	$2.33	[dd]$1.75	[dd]$1.75	$2.25	$1.55	$2.00	$2.00	$2.00	$2.00	$2.15	$2.00	$1.75	$2.00	$2.10	$2.10	$1.75	$1.75	$1.75	*	[a]$2.30	[a]$2.30	$2.10	$2.30	[1]$1.25
Atlanta, Ga	1.78	2.25	2.00	.90	.95	2.00	.95	2.25	2.00	2.00	2.10	2.25	2.00	1.75	1.50	2.00	2.00	1.50	1.50	1.65	1.75	1.50	1.75	2.00	1.75	1.25
Austin, Tex	1.88	2.50	2.00	.75	....	2.50	....	2.50	2.50	2.50	2.00	2.00	2.25	[5]1.75	1.63	[2]2.25	....	1.50	....	2.00	2.25	1.75	2.00	2.00	2.00	1.00
Baltimore, Md	2.20	3.00	2.40	1.25	1.25	3.00	1.35	2.25	2.25	2.25	2.15	2.25	2.25	[3]1.78	2.05	2.25	2.25	[4]1.85	....	2.25	*	1.75	2.20	1.58	2.20	1.15
Baton Rouge, La	1.88	2.50	2.25	.95	....	....	1.10	....	....	....	1.88	2.25	2.25	[5]1.63	2.00	2.25	2.25	....	....	1.75	2.25	1.88	2.25	2.25	2.25	1.25
Birmingham, Ala	1.80	2.50	2.08	.95	1.05	2.50	.95	2.20	2.25	1.75	2.08	2.00	2.25	2.00	1.80	2.25	2.25	[6]1.65	1.90	1.90	*	1.75	2.00	1.75	2.00	1.25
Bismarck, N. D	1.60	2.25	2.25	[c]1.15	[c]1.15	2.25	1.25	2.00	....	2.25	1.75	1.60	1.75	1.50	1.50	1.75	1.75	1.50	1.50	1.75	*	1.65	1.90	1.50	[d]1.90	1.25
Boston, Mass	2.10	2.50	2.40	1.55	1.55	2.50	1.55	2.50	2.25	2.25	2.50	2.50	2.30	2.00	2.00	2.30	2.30	2.15	2.50	2.30	2.30	[7]2.08	[8]2.45	2.08	2.45	1.35
Boise, Idaho	1.75	2.25	1.98	1.28	1.28		1.63	2.25	....	....	1.88	2.13	....	[41]1.70	....	2.00	....	1.63	....	1.73	1.43	1.63	1.73	1.63	2.03	1.43
Buffalo, N. Y	2.25	2.50	2.40	1.65	1.65	2.50	1.75	2.40	2.23	2.23	2.23	2.40	2.37	2.13	....	2.40	2.40	2.30	2.15	2.25	*	2.35	2.35	1.90	2.40	1.55
Charleston, S. C	1.63	2.25	2.00	.70	.70	2.50	.75	2.00	2.00	2.00	2.25	2.00	2.25	....	....	2.25	2.25	1.50	1.50	2.00	1.56	1.50	1.50	....	1.25	.85
Charleston, W. Va	2.13	2.50	2.25	1.30	1.30	2.50	1.45	2.25	2.30	2.30	2.00	2.13	2.25	2.00	1.90	2.00	2.25	1.75	1.75	2.05	2.25	2.25	2.25	1.80	2.25	1.52
Charlotte, N. C	1.50	2.00	2.00	.88	.80	1.75	[f]1.25	1.83	2.00	2.00	1.50	1.50	1.50	[9]1.50	1.50	2.13	2.13	1.50	1.50	1.50	1.50	1.38	1.38	[10]1.25	1.50	....
Cheyenne, Wyo	1.85	2.40	1.85	[bb]1.00	1.15	....	....	2.15	....	....	1.90	....	....	....	1.85	2.00	2.00	....	....	1.88	2.00	2.00	2.45	2.30	[11]2.25	1.50
Chicago, Ill	2.35	2.40	2.40	1.70	1.70	2.40	1.70	2.40	2.35	2.35	2.35	2.40	2.43	2.30	2.45	2.35	2.35	[6]2.40	2.40	2.35	2.40	[12]2.35	....	2.05	2.65	[13]1.55
Cincinnati, Ohio	2.20	2.50	2.35	1.46	1.46	2.50	1.66	2.38	2.34	2.34	2.10	2.25	2.38	2.00	2.25	2.35	2.35	2.13	2.25	2.13	....	2.50	2.50	2.50	2.50	1.30
Cleveland, Ohio	[14]2.33	2.38	2.38	1.73	1.73	....	1.73	2.38	2.25	2.25	2.25	2.38	2.38	2.13	2.25	2.38	2.38	2.30	2.30	2.25	*	2.25	2.25	....	2.38	....
Columbia, S. C	1.50	2.00	2.00	.80	.80	2.25	1.25	2.00	2.00	2.00	2.00	1.75	1.75	1.75	1.50	2.25	2.25	1.75	1.75	1.75	2.00	1.50	1.75	1.75	1.75	1.50
Concord, N. H	1.88	2.00	2.25	1.15	1.15	2.00	1.25	2.00	2.00	2.00	2.00	1.88	1.50	1.35	....	1.50	1.50	1.88	....	2.00	2.00	2.15	2.15	1.70	2.15	1.35
Conway, Ark	1.65	1.65	1.88	.65	[illegible]	2.00	1.25	1.88	....	....	1.65	1.88	1.88	1.25	....	1.88	1.88	1.50	....	....	1.50	....	....	....	....	....
Dallas, Tex	2.25	[47]2.50	2.25	1.08	1.28	2.25	1.10	[47]2.13	2.13	2.13	2.13	[47]2.13	2.00	2.00	1.75	2.38	2.38	1.75	1.88	2.25	2.38	2.00	2.25	2.25	2.25	2.25
Dayton, Ohio	2.15	2.63	2.30	1.40	[x]1.38	2.63	1.38	2.30	2.25	2.25	1.98	2.30	2.50	2.03	2.08	2.26	2.26	2.15	1.95	2.15	....	2.15	....	1.68	2.40	[z]1.50
Denver, Colo	2.10	2.25	2.00	1.40	1.35	2.25	1.43	2.25	2.25	2.25	2.25	2.25	2.25	1.93	[15]1.72	2.24	2.24	2.10	2.23	2.00	2.00	2.00	2.15	2.00	2.15	1.50
Des Moines, Iowa	2.00	2.63	2.13	1.40	1.40	2.63	1.50	2.25	2.00	2.00	2.00	2.20	2.15	1.75	1.65	2.25	2.25	1.50	1.50	2.00	*	1.93	2.10	....	2.10	....
Detroit, Mich	2.20	2.50	2.40	1.58	1.58	2.50	1.58	2.50	2.28	2.28	2.05	2.50	2.40	2.10	1.90	2.40	2.40	2.28	2.05	2.28	*	2.20	2.40	2.20	2.20	[16]1.70
Duluth, Minn	1.80	2.05	2.05	[m]1.40	[m]1.40	2.05		2.25	....	1.90	1.70	2.25	2.10	1.90	1.50	2.00	2.00		....	2.00	....	2.00	2.00	[22]2.00	2.20	1.40
Fort Worth, Tex	2.00	2.50	2.25	.90	.90	2.50	[f]1.25	2.50	2.00	2.00	2.25	2.50	2.25	2.00	1.75	2.25	2.25	1.75	1.88	2.25	2.13	2.00	2.25	2.25	2.25	[aa]
Harrisburg, Pa	1.83	2.50	2.50	1.20	1.20	2.00	1.38	2.13	2.25	2.00	2.13	2.25	2.00	1.55	1.74	2.25	2.25	1.50	1.50	2.00	2.00	2.13	2.13	1.75	2.65	1.33
Helena, Mont	2.00	2.00	1.88	1.25	1.38	....	1.60	2.35	....	....	2.25	2.50	1.90	1.75	1.75	2.25	....	1.63	....	1.63	....	1.80	2.00	2.00	2.00	1.50
Houston, Tex	2.00	2.50	2.13	1.08	1.08	2.50	1.28	2.50	2.00	2.00	2.00	2.50	2.38	1.88	1.88	2.38	2.38	[17]1.88	1.88	2.38	....	1.88	2.13	1.88	2.13	1.43
Indianapolis, Ind	2.18	2.45	2.33	1.38	1.20	2.45	1.58	2.35	2.00	2.20	1.95	2.15	2.30	2.00	2.00	2.30	2.30	1.68	1.75	2.13	2.33	2.10	2.30	2.30	2.30	1.43
Jacksonville, Fla	1.75	2.30	2.00	.80	.90	2.30	.85	2.00	2.30	2.30	1.50	1.50	2.38	1.63	....	2.50	2.50	1.50	1.50	1.65	....	2.00	2.00	1.68	1.88	1.25
Jamestown, N. Y	2.00	2.50	2.13	1.50	[w]1.65	2.50	2.25	2.50	2.20	2.10	2.50	2.50	1.88	1.75	1.85	2.15	2.15	1.85	1.85	1.85	2.15	2.50	2.68	2.50	2.50	[z]1.50
Jefferson City, Mo	2.00	2.38	2.43	1.15	1.15	2.38	1.50	2.00	....	....	2.00	2.00	....	1.63	1.75	2.00	2.00	1.25	....	1.50	1.15	1.85	2.20	2.20	2.20	1.10
Kansas City, Mo	2.05	2.50	2.20	1.48	1.48	2.25	1.65	2.50	2.23	2.23	2.05	2.20	2.30	[18]2.05	2.15	2.38	2.38	1.90	[19]1.90	2.30	*	[20]2.05	[21]2.28	[22]2.05	2.28	1.50
Little Rock, Ark	2.50	2.88	2.38	.85	.95	2.25	1.50	2.38	1.88	2.50	2.50	2.25	2.25	1.88	1.88	2.50	2.50	2.00	1.75	1.88	1.88	1.58	1.75	1.50	2.00	[s]1.10
Los Angeles, Calif	2.04	2.63	2.30	1.49	1.49	2.63	....	3.13	2.40	2.50	2.11	[23]2.50	2.40	2.00	2.00	2.50	2.50	2.25	....	2.15	*	1.99	1.99	2.04	2.24	[24]1.56
Milwaukee, Wis	2.00	2.20	2.05	1.55	1.55	2.20	1.65	2.25	2.20	2.15	1.95	2.25	2.25	1.80	2.00	2.25	2.25	[6]1.90	1.90	2.05	2.05	2.05	2.05	2.00	2.35	[z]1.45
Minneapolis, Minn	2.05	2.25	2.18	1.45	1.45	2.25	1.55	2.35	2.15	2.25	2.15	2.35	2.21	1.95	1.85	2.25	2.25	1.90	1.90	2.15	*	2.00	2.00	[22]2.00	2.00	1.60
Nashville, Tenn.[42]	1.60	2.25	1.86	.88	.88	2.25	.90	2.25	1.75	1.75	1.75	2.00	2.00	1.63	1.55	1.90	1.90	1.35	....	1.75	1.90	1.50	1.80	1.80	1.85	[t].90
New Orleans, La	1.88	2.50	2.25	1.03	1.03	2.50	1.13	2.00	....	....	1.88	2.00	2.30	1.63	1.80	2.25	2.25	1.73	1.63	1.90	2.13	2.13	2.13	1.88	2.13	1.08
New York, N. Y	[42]2.75	[43]3.20	3.00	1.70	1.70	[42]2.75	[42]1.95	[43]3.20	2.75	2.75	[42]2.75	[42]2.75	[43]3.00	[42]2.45	[42]2.75	[25]3.00	[42]2.75	[26]2.75	[42]2.75	[42]2.75	....	[27]2.50	[28]2.75	[29]2.38	[30]3.13	1.64
Newark, N. J.[46]	[42]2.[illegible]0	[43]3.25	3.10	[42]2.13	....	....	[42][illegible].13	[43]3.25	2.75	2.75	[43]3.25	2.75	3.00	[42]2.50	2.60	2.50	2.50	[42]2.85	2.85	2.75	....	3.00	3.00	2.25	3.00	....
Norfolk, Va	1.75	2.00	2.15	.80	.80	2.00	.80	2.50	1.75	1.75	1.50	2.50	2.00	1.75	1.75	2.00	2.00	1.75	1.50	1.75	*	1.63	1.88	[31]1.88	1.88	1.00
Oklahoma City, Okla	2.00	2.25	2.25	1.25	1.10	2.25	1.50	2.75	2.25	2.25	2.50	2.75	[42]2.63	[42]2.12	[42]2.12	[42]2.50	[42]2.50	1.75	1.75	2.00	1.87	2.00	2.25	2.00	2.25	1.37
Omaha, Neb	2.07	2.40	2.28	1.28	1.28	2.40	1.28	2.40	1.95	2.10	2.08	2.28	2.20	1.85	1.70	2.15	2.15	1.83	1.83	2.00	2.10	2.00	2.28	2.28	2.28	1.28
Philadelphia, Pa	2.25	[42]2.75	2.65	1.25	1.55	2.40	1.25	3.00	2.40	2.40	2.25	2.50	2.75	[32]2.05	2.09	2.50	2.50	[45]2.15	[33]2.15	2.50	*	[40]2.50	[40]2.50	[40]2.13	[40]2.75	1.65
Phoenix, Ariz	2.10	3.00	2.10	1.45	1.45	3.00	1.82	2.25	3.00	3.00	2.10	2.50	2.25	1.97	1.97	2.25	2.25	1.75	3.00	1.90	2.03	1.98	1.98	2.03	2.23	1.55
Pierre, S. D	[e]1.75	[n]2.25	....	1.00	1.00	[n]2.25	1.00	[n]2.25	[o]2.75	[n]2.25	1.75	1.50	[p]1.85	[l]1.50	....	[q]2.00	2.00	[l]1.50	....	[l]1.50	[l]1.50		....	[l]1.50	[r]1.83	[s]1.10
Pittsburgh, Pa	2.50	2.70	2.50	1.50	1.75	2.70	....	2.63	2.50	2.13	2.50	2.63	2.38	2.20	2.00	2.50	2.50	2.25	2.25	2.50	....	2.65	2.55	2.65	2.65	[38]1.50
Portland, Ore	2.10	2.75	2.30	1.70	1.65	2.75	2.00	2.65	2.38	2.13	....	2.50	2.35	2.10	1.96	2.38	2.38	2.20	2.20	2.15	1.90	2.00	[22]2.30	2.00	[34]2.35	1.70
Providence, R. I	1.90	2.45	2.25	1.40	1.40	2.45	1.40	2.50	2.25	2.25	2.00	2.25	2.00	1.75	2.00	2.25	2.25	1.80	2.50	2.15	1.50	1.83	1.83	1.98	1.98	2.50
Raleigh, N. C	1.50	[i]2.00	[l]1.50	.75	[h]1.00	[i]2.00	.85	[g]1.75	2.00	2.00	1.50	1.25	1.75	1.50	....	2.25	2.25	1.35	....	1.50	....	....	....	....	....	....
Richmond, Va	1.80	2.50	2.25	.90	1.15	....	....	2.25	1.63	1.63	1.75	2.13	2.00	1.63	1.63	2.25	2.25		....	1.88		1.75	2.00	1.88	1.75	1.00
St. Louis, Mo	2.45	2.75	2.43	1.50	1.40	2.50	1.80	2.50	2.30	2.18	2.50	2.50	2.50	2.32	2.50	2.50	2.50	2.13	2.50	2.50	2.50	2.00	2.55	2.55	2.55	1.80
St. Paul, Minn	2.05	2.25	2.18	1.45	1.45	2.25	1.55	2.30	2.15	2.25	2.00	2.30	2.21	1.90	1.85	2.25	2.25	1.90	1.90	2.15	*	2.00	2.00	[22]2.00	2.00	1.60
St. Petersburg, Fla.[39]	1.75	2.25	1.75	1.00	.75	2.00	1.25	2.25	2.25	2.25	1.75	1.75	2.25	1.50	1.50	2.00	2.00	1.50	1.50	2.00	2.00	1.50	1.50	1.50	1.50	1.00
Salt Lake City, Utah	1.83	2.25	2.00	1.28	1.28	2.25	1.65	2.25	2.05	2.05	1.83	2.25	2.00	[i]2.00	1.56	2.00	2.00	1.75	1.75	1.88	*	1.75	1.85	1.90	2.05	1.50
San Antonio, Tex	2.00	2.25	2.00	.90	.90	2.25	1.17	2.50	2.00	2.00	2.25	2.50	2.25	1.75	1.75	2.38	2.13	1.38	2.00	2.25	*	[20]1.50	[21]1.75	1.50	1.50	1.00
San Diego, Calif	2.04	2.50	2.24	1.49	1.49	2.50	1.75	[42]2.50	2.50	2.50	2.11	[42]2.50	2.38	2.10	1.96	2.50	2.50	2.16	1.90	2.18	*	....	[21]1.93	2.04	2.24	1.56
San Francisco, Calif	2.16	2.81	2.40	1.53	1.53	2.87	2.25	[42]2.34	2.00	2.68	2.15	2.81	2.50	[42]2.46	2.00	2.38	2.38	2.16	....	2.13	2.15	[36]2.13	....	2.23	[37]2.53	1.78
Seattle, Wash	2.20	2.50	2.40	1.80	1.70	2.50	2.05	2.50	2.25	2.25	2.20	2.40	2.40	2.20	2.15	2.50	2.50	2.20	2.20	2.35	2.35	2.33	2.33	2.38	2.63	[cc]2.38
Springfield, Ill	2.13	2.75	2.25	1.45	1.45	2.75	1.55	2.50	1.50	....	2.13	2.13	2.38	2.00	2.00	2.50	2.50	2.05	2.05	2.10	*	1.75	2.15	2.15	2.15	1.75
Tacoma, Wash	2.19	2.63	2.25	1.81	1.81	2.38	2.05	2.25	2.25	2.25	2.18	2.15	2.40	2.19	1.96	2.34	2.34	2.06	2.06	2.21	*	2.20	2.20	1.95	[v]2.80	[u]2.25
Toledo, Ohio	2.18	2.40	2.40	1.60	....	2.40	1.72	2.40	2.40	2.40	2.40	2.40	2.40	[18]2.03	1.70	2.38	2.38	2.13	2.40	2.13	*	2.15	2.15	1.83	2.40	[38]1.48
Topeka, Kan	1.75	2.25	2.20	1.10	1.10	2.25	1.15	2.25	2.25	2.25	1.98	2.00	2.00	1.80	1.65	2.25	2.25	1.65	2.25	1.95	*	1.63	2.00	1.75	1.90	1.20
Trenton, N. J	2.50	2.65	2.75	1.60	....	2.65	1.60	2.65	....	2.65	2.65	2.50	2.75	2.00	2.09	2.50	2.50	2.25	2.25	2.50	....	....	3.00	2.25	3.00	....
Tulsa, Okla	2.25	2.50	2.25	1.25	1.15	[42]2.50	[42]1.50	[42]2.75	[42]2.25	2.25	2.62	2.75	[42]2.25	[42]2.25	[42]2.25	[42]2.75	[42]2.75	2.00	2.00	2.25	2.00	2.00	2.25	2.00	2.25	1.60
Wilmington, Del	2.25	2.75	2.65	1.30	1.30	2.50	1.55	2.50	2.25	2.25	2.25	2.25	2.50	1.93	2.09	2.40	2.40	[26]2.50	....	2.25	....	....	....	....	....	1.50

NOTE: Hourly rates are rounded to the closest cent where fractional parts of cent are quoted. * Same as craft doing work. [1] Up to 3 tons. Over 3 tons, $1.50. [2] $18 per day. [3] Brush. Spray and steel, $1.80. [4] Composition. Slate or tile, $2.15. [5] Brush. Steel and sign, $2.00; spray, $2.25. [6] Composition. [7] Up to 3 stories. [8] High speed over 3 stories. [9] Brush. Spray, $1.83. [10] 40-hp. [11] ¾ yds. and smaller. [12] ½-drum. [13] Less than 2 tons. [14] Plus 5¢ per hr. for tool replacement. [15] Inside. Outside, $1.89. [16] Dump truck. All other, $1.60. [17] Composition. Slate and tile, $2.13. [18] Brush. Spray, $2.30. [19] Spray. [20] Light. [21] Heavy. [22] Over 50-hp. [23] Metal. [24] 6 tons and under. [25] Man. and Bronx, 7-hr. day. Brooklyn and Queens, $2.81; 8-hr. day. [26] Slate and tile. [27] $100 per week. [28] $110 per week. [29] $95 per week. [30] $125 per week. [31] With attachments. Without attachments, $1.63. [32] Brush. Other, $2.18. [33] Composition. Slate and tile, $2.50. [34] 1-5 cu. yds. [35] Elevator. [36] Material hoist. [37] Up to and including 1 yd. Over 1 yd., $2.63. [38] Dump truck. [39] No local unions. [40] Retroactive to May, 1948. [41] Brush. Spray, $2.38. [42] 7-hr. day. [43] 6-hr. day. [44] On compulsory 7-hr. day. [45] Composition. Slate and tile, $2.55. [46] Overtime paid double, Carpenters double plus 9 paid holidays, painters double plus 7½¢ per hr. w. f. [47] $5-10/day bonus from some contractors (up for adjustment, 1949).

WAGE RATE RANGES: [a] $1.55-$2.30. [b] $1.63-$1.75. [c] $1.05-$1.15. [d] $1.65-$1.90. [e] $1.75-$2.50. [f] $.90-$1.25. [g] $1.50-$1.75. [h] $1.00-$1.50. [i] $1.50-$2.00. [j] $1.50-$1.80. [k] $1.25-$1.63. [l] $1.25-$1.50. [m] $1.30-$1.40. [n] $2.00-$2.25. [o] $2.25-$2.75. [p] $1.25-$1.85. [q] $1.75-$2.00. [r] $1.65-$1.83. [s] $1.00-$1.10. [t] $.85-$1.00. [u] $1.80-$2.25. [v] $2.50-$2.80. [w] $1.50-$1.65. [x] $1.38-$1.50. [y] $.93-$1.38. [z] $1.45-$1.50. [aa] $1.10-$1.25. [bb] $.90-$1.00. [cc] $1.93-$2.38. [dd] $1.35-$1.75.

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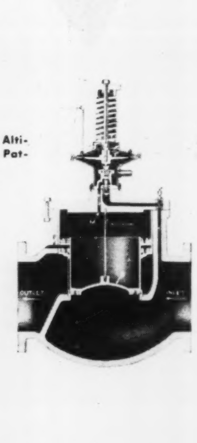
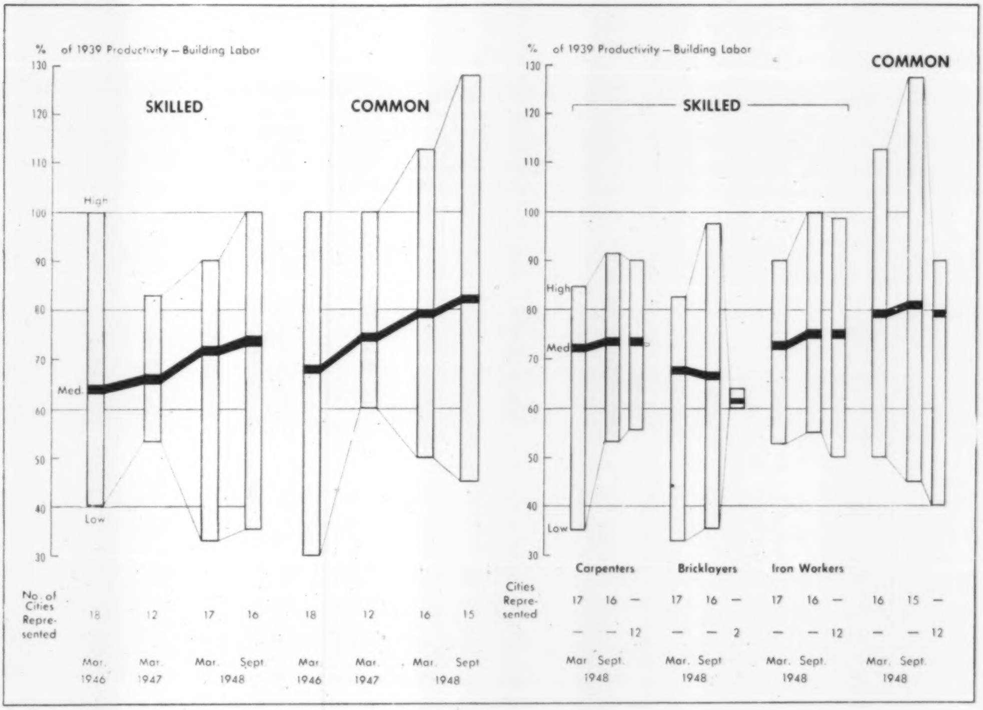


G-A Single Acting Altitude Valve, Globe Pattern.



Labor Productivity Continues Slow Rise

Skilled building labor productivity inched up to 73 percent of 1939, and common labor to 82 percent in September, 1948, but improvement continued to be somewhat spotty. These median figures for 16 cities compare with 71 percent for skilled labor, carpenters, bricklayers and ironworkers, in March 1948 and 80 percent for common labor reported from 17 cities in March, 1949.

The highest productivity reported for September, 1948 is 100 percent of 1939 for skilled labor (in Denver) and 128 percent for common labor (in New Orleans).

Reports to ENGINEERING NEWS-RECORD from 35 building contractors in large cities and from 4 building contractors working in 12 areas away from large cities are in substantial agreement. Also comments of individual contractors, when analysed, support as well as amplify the "statistics."

A majority of these contractors report that productivity is up or up slightly. Less than one third report that it is not improving. A few report that improvement is mixed or spotty. One contractor reports that "trades are evening up," another that "more good men are available," another that "men are becoming better trained and more experienced," another that "supply of labor is better but output per man has not improved."

By trades, carpenters seem to have made the best overall gain, bricklayers and the trowel trades the least. One contractor reported "bricklayers static," another "bricklayers scarce but producing better."

A majority reports that ironworkers productivity is increasing but one reports that it is declining. Another says, "Steel erectors are hard to get, skilled riveting gangs almost impossible to get, heaters are short and available only in big cities, those you get are inexperienced and incompetent."

By cities, better than average productivity for skilled labor in September, 1948, compared with 1939, is reported from Atlanta, Boston, Los Angeles, Minneapolis, New Orleans, New York and St. Louis. For common labor better than average productivity is reported in Cleveland, New Orleans, New York, St. Louis, and San Francisco.

Reports for 12 areas away from large cities show 73 percent median for

Table I Productivity by Trades
1939 = 100

	1948 1st Qtr.		
	Low	Median	High
Carpenters	36	72.5	85
Bricklayers	33	69	81.5
Ironworkers	52.5	73	90
3 Skills Combined	33	71	90
Common	50	80	112

	1948 3rd Qtr.		
	Low	Median	High
Carpenters	53	73	91
Bricklayers	36.5	68	97
Ironworkers	55	76.4	100
3 Skills Combined	36.5	73	100
Common	45.5	82	128

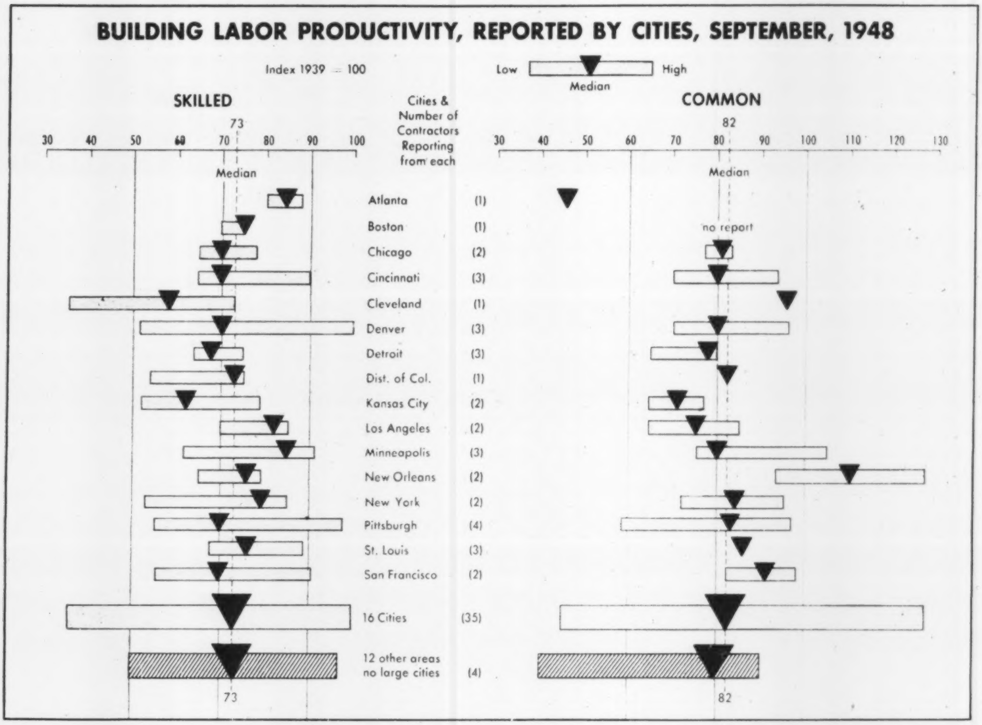
Formula Used for Computing Changes in Labor Productivity

$$\frac{\text{1948 Theoretical Cost}}{\text{1948 Actual Cost}} = \text{Productivity \% of 1939}$$

Theoretical cost = \$1 unit of work in 1939 plus percent increase in hourly wage rate for trade studied

Actual cost = present cost from experience records of the same unit of work that cost \$1 in 1939

BUILDING LABOR PRODUCTIVITY, REPORTED BY CITIES, SEPTEMBER, 1948



skilled productivity compared with 73 percent in the 16 reporting cities and a low-high range of 50-98 compared with the range of 36-100 in the cities covered.

Common labor in the 12 areas away from large cities is not so closely comparable. A median of 80 compares with the city median of 82 and the low-high range of 40-90 compares with the city range of 45.5-128.

The nine matching cities reported in Table II show lower medians, 70 for skilled and 80 for common, than the 73 and 82 for all 16 cities.

Skilled labor productivity is reported higher than this group median in Los Angeles, St. Louis, Minneapolis and New York City. Common labor is more productive than this median in St. Louis, Cleveland, Pittsburgh and New York City. Pittsburgh reports the highest high productivity for skilled trades, with 98 percent of 1939. Minneapolis is high for common, with 106.5 of 1939.

Costs Forecasts

Late in 1948, and before the break in lumber prices could be positively defined as sustained, the majority of contractors reporting expected building costs to rise in the first half of 1949. Rises of 4 percent, 5 percent, one of 10 percent were predicted by this group. A small minority thought costs would stabilize or show very little change. One third thought costs would go down slightly, one contractor predicted 3 to 5 percent, another "stable to down 5 percent." Contractors predicting increases noted "because of wage increases." One, forecasting a decrease, qualified with "unless the 4th round of wage increases starts."

For the second half of 1949 almost half the contractors thought costs would stabilize or level off. A third thought they would level off or tend to go down some, one thought as much as 5 percent. One fourth of those reporting thought a rise could be expected. One contractor estimated that "with wage increases, costs will go up 10 percent," another that 2nd half costs would be up 20 percent from 1948. Another contractor felt that costs would rise because of the large volume of work.

Since these predictions, lumber prices have continued their gradual decline, the cost of living has continued down, scrap iron prices have dropped drastically.

Table II Building Labor Productivity in 9 Matching Cities 1939=100

City	Date of survey	Skilled Labor Low	Skilled Labor Med.	Skilled Labor High	Common Labor Low	Common Labor Med.	Common Labor High
New York	3rd '48	53	80	85	71	83	95
	1st '47	36	70.8	85	57	90	96
	1st '47	62	64.5	67	62	67.5	73
	1st '46	60	64	75	50	60	75
Pittsburgh	3rd '48	56	70	98	59	83.3	99
	1st '48	70	79	84	93	93	93
	1st '47	65	73	81	68	83	97
	1st '46	55	68	91	70	75	90
Cleveland	3rd '48	36	58	73	96	96	96
	1st '48	73	73	77	95.5	95.5	95.5
	1st '47	57	57	57	64	64	64
	1st '46	60	68	75	60	72	80
Cincinnati	3rd '48	65	70	90	70	80	93
	1st '48	66.7	70	79	66.7	76	80
	1st '47	71	76	75	60	70	80
Detroit	3rd '48	63	68	75	66	78	80
	1st '48	50	64.8	77	66.7	80	80
	1st '47	52	63	75	60	77.5	90
	1st '46	50	61	80	50	62	85
Minneapolis	3rd '48	61	85	91	76	80	106.5
	1st '48	50	65.5	66.5	80.5	80.5	80.5
	1st '47	54	66	72	75	77.5	80
	1st '46	60	67	80	60	68	75
St. Louis	3rd '48	69	76	89	86	86	86
	1st '48	59	66	72	66.5	73	80
	1st '47	59	64	81	66	80	92
	1st '46	50	65	75	50	68	80
Kansas City	3rd '48	52	62	79	64.5	71	77
	1st '48	52	69	80	62.2	76	80
	1st '47	62	67	71	72	77	92
	1st '46	40	70	85	60	67	85
Los Angeles	3rd '48	70	82	85	64	75	85
	1st '48	74	74	74	65	65	65
	1st '47	80	80	80	75	75	75
	1st '46	55	55	55	60	60	60
9 Cities	3rd '48	36	70	98	59	80	106.5
	1st '48	36	70	85	57	80	96
	1st '47	52	66	83	60	77	97
	1st '46	40	67	91	50	68	90

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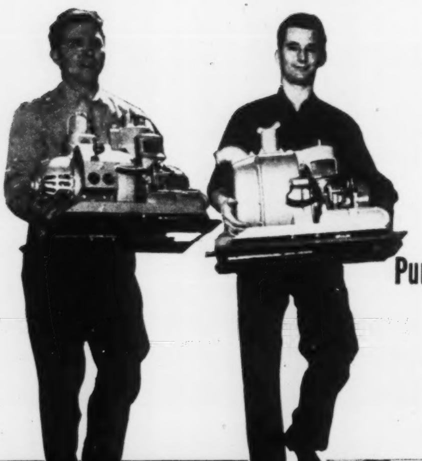

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BASE RATES ON COMPENSATION INSURANCE FOR CONSTRUCTION—FEBRUARY 1, 1949

Data Compiled by Herbert L. Jamison & Co., Insurance Advisers and Auditors, New York, N. Y.
(Base rates in effect February 1, 1949—subject to increase or decrease according to experience ratings)

Classification of Work (A)	Ala.	Alas.	Ariz.	Ark.	Cal.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Idaho	Ill. (L)	Ind.	Iowa	Kans.	Ky.	La.	Me.	Md.	Mass. (L)	Mich.	Minn.	Miss.	Mo.	Mont.	Neb.
1. Carpentry — private residence	1.30	3.47	5.56	4.28	3.93	2.10	4.05	1.30	2.40	(Z)	1.33	2.61	2.34	2.18	2.61	2.04	2.91	4.36	1.79	1.90	2.75	(Z)	2.86	4.43	3.42	3.14	2.70
2. Carpentry — 3 stories or less	1.30	3.95	5.56	4.28	3.93	2.10	4.05	1.30	2.53	(Z)	1.33	2.61	3.07	2.62	2.61	2.62	2.91	4.44	1.79	2.09	2.75	(Z)	2.86	4.43	3.42	3.14	2.70
3. Carpentry — interior trim	.74	2.34	5.56	2.04	3.93	.93	2.02	1.30	1.81	1.18	.98	1.29	1.21	1.03	1.07	1.20	1.34	1.89	1.02	1.85	1.65	2.00	2.86	2.09	3.42	1.54	1.17
4. Carpentry — general	1.56	7.94	5.56	5.41	3.93	2.77	5.06	1.30	3.52	2.33	2.73	4.07	3.65	2.62	2.61	3.64	3.52	4.58	3.04	3.69	6.19	3.40	2.86	5.57	3.42	5.02	2.70
5. Concrete or cement walk laying (B)	.93	2.76	3.59	2.24	1.45	1.13	2.05	.90	1.50	1.55	1.45	1.60	1.35	1.21	1.24	1.48	1.58	2.32	1.27	2.06	1.73	1.60	1.44	2.28	2.24	1.89	1.45
6. Concrete work — general (B)	2.33	7.14	(X)4.94	4.23	3.11	2.62	5.17	1.30	4.03	2.60	2.00	4.23	2.90	2.28	2.88	(X)3.89	3.15	4.78	2.43	3.18	4.01	3.21	2.20	4.34	5.55	4.58	2.48
7. Concrete work — dwellings — 3 stories or less (B)	.89	6.75	(X)4.94	2.68	1.45	2.03	3.08	1.30	3.63	1.88	.95	2.08	2.17	1.36	1.41	2.10	1.53	2.86	1.84	2.11	4.56	1.65	1.60	2.73	2.69	2.47	1.70
8. Concrete — bridges	3.21	(J)	(J)	8.88	5.46	3.79	9.50	1.30	8.13	4.38	4.00	5.74	4.14	4.08	5.68	4.76	5.30	5.76	6.01	5.93	8.00	5.11	5.90	9.11	9.60	7.00	5.08
9. Electric wiring	1.19	1.83	2.83	1.90	2.19	1.15	1.89	1.00	1.53	1.32	1.33	1.45	1.21	1.05	1.51	1.25	1.52	1.61	1.00	1.73	1.32	1.23	1.01	1.94	1.83	1.70	1.48
10. Excavation — earth (C)	1.70	3.82	5.61	3.88	2.11	3.12	3.66	.90	2.78	1.95	1.48	4.43	1.87	1.41	2.00	2.81	2.50	2.13	2.57	2.58	3.68	2.03	2.36	4.00	3.26	5.06	1.81
11. Excavation — rock (D)	2.61	9.09	10.22	7.02	5.01	3.22	7.05	.90	6.04	4.35	3.47	5.22	4.25	3.63	3.53	4.64	4.98	6.50	3.23	4.57	7.90	4.70	4.88	6.61	7.71	5.81	4.43
12. Glazing	2.13	4.33	5.52	5.17	5.18	2.58	5.38	.55	4.19	3.43	2.58	3.81	2.96	2.90	2.85	3.48	3.96	5.19	2.72	3.65	3.80	3.40	3.77	5.30	4.80	4.63	3.28
13. Insulation	.98	3.50	(J)	2.96	2.76	1.52	2.33	(J)	2.38	1.60	1.06	2.16	1.80	1.71	1.76	1.99	2.15	2.49	1.59	1.93	2.84	1.88	1.98	3.06	2.84	2.57	1.92
14. Lathing	.99	3.50	4.07	2.70	2.76	1.23	2.63	.60	1.95	1.41	1.28	1.76	1.38	1.36	1.38	1.62	1.82	2.49	1.33	1.77	2.39	1.78	1.62	2.76	3.46	2.12	1.58
15. Masonry	.89	5.95	4.39	2.68	2.24	2.03	3.08	.90	2.32	1.88	.95	2.08	2.29	1.36	1.41	2.10	1.53	2.86	1.84	2.11	4.56	1.65	1.60	2.73	2.69	2.47	1.70
16. Painting (I)	1.51	4.77	4.16	3.48	3.89	2.02	4.29	1.10	2.89	1.93	1.61	2.97	1.92	2.00	2.12	2.39	2.33	3.28	1.67	2.72	(J)	2.63	2.06	3.56	3.60	3.62	2.27
17. Plastering — interior	.98	3.50	3.57	2.96	2.76	1.52	2.33	.60	2.38	1.60	1.06	2.16	1.80	1.71	1.76	1.99	2.15	2.71	1.59	1.93	2.84	1.88	1.98	3.06	2.84	2.57	1.92
18. Plumbing	.69	1.82	3.00	1.88	1.45	1.01	2.18	.65	1.58	1.25	.91	1.54	1.28	1.23	1.18	1.22	1.43	2.21	1.56	1.62	1.61	1.50	1.49	1.94	1.78	1.85	1.59
19. Pile driving other than wharf	5.05	9.10	15.56	13.88	9.04	6.75	6.18	(J)	9.26	5.51	5.19	9.76	5.74	6.76	5.50	9.10	9.89	15.26	3.35	5.17	(X)4.89	8.70	7.19	14.24	19.15	11.96	8.52
20. Roofing	3.46	8.95	9.29	8.24	7.54	4.41	9.59	1.40	7.49	3.94	3.31	7.31	4.78	4.67	6.61	7.04	5.97	7.98	6.25	7.32	8.90	6.81	5.84	8.52	7.39	8.91	7.21
21. Sheet metal erection	1.41	3.04	4.08	3.33	3.04	1.67	3.52	1.40	2.53	2.11	1.46	2.19	2.08	1.91	1.98	1.82	2.67	3.82	1.56	2.07	1.86	1.66	1.55	3.39	2.53	2.61	2.35
22. Steel erection — general	5.35	11.05	20.31	14.89	6.88	6.94	9.86	3.10	15.81	6.36	5.53	10.41	5.96	3.88	9.46	8.20	8.20	10.71	7.04	7.65	13.70	6.06	7.78	15.22	11.09	12.63	8.69
23. Steel erection — structural	6.48	19.60	20.31	16.22	13.32	11.26	14.31	3.10	21.05	9.24	8.04	14.69	9.32	6.97	12.10	11.63	13.27	10.71	7.95	9.49	16.37	17.57	8.23	16.64	20.27	18.23	11.34
24. Steel erection — interior ornamental	1.45	4.59	3.89	3.80	3.49	1.77	3.77	1.60	3.69	2.26	1.80	(Z)	2.33	1.98	1.95	2.37	2.63	3.66	1.92	2.55	2.94	2.36	2.65	3.93	4.28	3.06	2.24
25. Steel erection — dwellings 2 stories or less	3.30	10.77	8.04	9.01	13.32	4.50	8.84	3.10	6.99	5.58	4.33	6.70	5.80	3.61	4.63	6.12	6.77	7.65	4.69	6.28	(J)	6.82	5.90	9.26	10.44	8.26	5.24
26. Steel sash and door	1.36	5.21	3.89	3.33	3.49	1.69	3.64	3.10	2.69	2.33	1.73	(Z)	2.78	1.88	1.87	2.24	2.55	3.47	1.83	2.42	2.94	2.55	2.53	3.44	3.63	2.92	2.16
27. Tile marble or stone setting interior	.66	1.11	2.46	1.74	1.47	.79	1.77	.35	2.00	.89	(Z)	1.11	1.05	.88	.91	1.03	1.14	1.63	.90	1.33	1.41	1.60	1.22	1.78	1.91	1.32	1.02
28. Watchmen and timekeepers (H)	1.46	5.95	1.99	3.18	(F)	1.81	3.91	(J)	2.77	2.33	1.90	2.53	2.45	1.98	2.03	2.37	2.57	3.70	1.95	2.56	3.10	2.51	2.68	3.26	4.30	3.01	2.30
29. Waterproofing: Application by means of brush	1.51	4.77	4.16	3.48	3.89	2.02	4.29	(J)	2.89	1.93	1.61	2.97	1.92	2.00	2.12	2.39	2.33	3.28	1.67	2.72	(J)	2.63	2.06	3.56	3.60	3.62	2.27
Application by means of trowel (Int.)	.98	3.50	3.57	2.96	2.76	1.52	2.33	(J)	2.38	1.60	1.06	2.16	1.80	1.71	1.76	1.99	2.15	2.71	1.59	1.93	2.84	1.88	1.98	3.06	2.84	2.57	1.92
Application by means of trowel (Ext.)	.89	5.95	4.39	2.68	2.24	2.03	3.08	(J)	2.32	1.88	.95	2.08	2.29	1.36	1.41	2.10	1.53	2.86	1.84	2.11	4.56	1.65	1.60	2.73	2.69	2.47	1.70
Application by means of pressure gun	2.33	7.14	(X)4.94	4.23	3.98	2.62	5.17	(J)	4.03	2.60	2.00	4.23	2.90	2.28	2.88	3.89	3.15	4.78	2.43	3.18	4.01	3.21	2.20	4.34	5.55	4.58	2.48
30. Wrecking	8.46	15.99	28.43	20.69	17.88	10.43	20.95	9.00	16.69	11.93	10.41	....	12.04	7.59	11.42	9.84	15.54	29.54	10.91	13.00	(X)16.32	25.04	11.32	21.28	17.71	18.47	13.14

Classification of Work (A)	Nev. (E)	N. H.	N. J.	N. M.	N. Y.	N. C.	N. D. (E)	Ohio (E, M)	Okla.	Ore. (G)	Pa.	R. I. (L)	S. C.	S. D.	Tenn.	Texas	Utah	Vt.	Va.	Wash. (G)	W. Va. (E)	Wisc.	Wyo. (E)
1. Carpentry — private residence	State Insurance Plan Nevada Industrial Commission, Carson City, Nev. Rates publ. ENR, May 27, 1948 p. 157 apply until July, 1949. Recheck for possible revision then.	2.39	3.10	2.21	Z	1.38	North Dakota State Plan Workmen's Compensation Bureau, Bismarck, N. D. Rates publ. ENR, May 27, 1948 p. 157 apply except effective July 1, 1948 a 5%–25% discount is allowed on renewal premiums, depending on coverage period.	1.01	4.28	6.36	1.55	5.85	2.93	1.53	1.87	2.82	(Z)	1.83	1.91	4.59	West Virginia State Plan: State Compensation Commission, Charleston, W. Va. See ENR, May 27, 1948 p. 157 for rates.	3.42	Wyoming State Plan: Manager, Workmen's Compensation Dept. State Treasurer's Office, Cheyenne, Wyoming. Rates publ. ENR, May 27, 1948 p. 157 apply except new requirements for non-resident employers (Y)
2. Carpentry — 3 stories or less		2.39	3.60	2.21	Z	1.82		1.01	4.28	6.36	1.55	5.85	2.93	1.53	1.87	(Z)	(Z)	1.83	1.91	4.59		3.42	
3. Carpentry — interior trim		1.31	2.10	.98	Z	1.28		.97	2.56	2.94	1.55	4.40	1.90	1.13	1.24	2.17	(Z)	.81	.97	1.50		3.42	
4. Carpentry — general		4.68	4.00	3.01	6.42	2.54		.97	5.93	7.49	1.55	12.70	5.75	1.47	3.02	3.66	1.70	2.52	2.52	6.08		3.42	
5. Concrete or cement walk laying (B)		1.60	(X)1.90	1.23	(X)3.70	1.19		.75	2.88	3.19	1.75	5.29	2.66	1.37	1.42	(Z)	1.42	1.01	.90	2.30		2.08	
6. Concrete work — general (B)		4.42	(X)5.20	2.31	(X)6.29	2.22		1.01	5.96	6.69	2.25	7.20	5.99	2.34	1.97	3.66	(X)3.11	2.21	1.98	5.15		3.19	
7. Concrete work — dwellings — 3 stories or less (B)		2.86	(X)5.10	1.50	Z	1.31		1.01	4.13	5.83	2.25	6.29	2.12	1.39	1.48	(Z)	2.30	2.04	1.10	4.48		2.24	
8. Concrete — bridges		6.35	(X)5.60	4.76	9.37	5.06		1.48	11.58	9.84	2.25	19.80	12.06	4.29	(Z)	(Z)	5.13	3.55	3.80	7.57		6.39	
9. Electric wiring		1.37	1.36	1.03	3.67	1.36		.69	2.35	3.29	1.00	3.01	2.35	1.19	1.24	2.22	1.45	.89	1.10	2.53		1.69	
10. Excavation — earth (C)		3.03	(X)4.30	3.84	5.61	1.41		.91	4.20	7.46	1.75	10.52	3.32	2.00	2.05	(Z)	2.86	2.43	1.50	5.39		3.78	
11. Excavation — rock (D)		4.60	8.09	3.40	(X)11.31	6.15		1.80	8.88	(J)	1.75	16.42	7.60	3.86	5.07	7.15	4.03	2.78	3.44	10.49		6.67	
12. Glazing		3.55	4.60	2.72	9.70	3.24		1.35	7.10	6.73	1.00	13.09	6.11	2.75	3.36	5.47	1.15	2.22	2.54	5.17		5.74	
13. Insulation		2.11	2.85	1.57	5.17	1.59		....	3.95	5.72	(Z)	7.08	3.24	1.73	1.65	2.84	3.09	1.30	1.43	4.04		2.73	
14. Lathing		1.72	2.85	1.32	3.29	1.56		.56	3.40	5.72	.85	6.08	2.83	1.42	1.65	2.91	1.75	1.07	1.24	4.04		2.99	
15. Masonry		2.86	4.30	1.50	5.97	1.31		1.48	4.13	5.83	1.35	6.29	2.12	1.39	1.48	3.66	1.92	2.04	1.10	4.48		2.24	
16. Painting (I)		2.85	(X)5.30	2.07	8.17	1.82		1.35	4.10	6.67	2.00	7.57	4.22	2.34	1.88	2.48	1.94	1.71	1.42	5.13		2.07	
17. Plastering — interior		2.11	2.85	1.57	5.17	1.59		.56	3.95	5.72	.85	7.08	3.24	1.73	1.65	2.84	3.09	1.30	1.43	4.04		2.42	
18. Plumbing		1.42	1.85	1.23	3.68	1.23		.71	2.10	2.91	.95	3.32	2.18	1.41	1.14	2.01	.95	1.15	.90	2.24		1.99	
19. Pile driving other than wharf		4.68	5.60	7.13	7.82	8.73		7.69	18.85	15.90	4.00	13.71	11.09	7.40	8.79	13.57	5.62	2.90	5.31	11.67		11.36	
20. Roofing		7.36	7.60	6.49	Z	4.50		3.07	16.74	15.59	2.15	18.91	8.11	5.26	3.97	7.60	5.37	4.25	5.09	(J)		8.33	
21. Sheet metal erection		2.08	2.35	1.60	(X)4.83	1.87		3.29	3.67	6.42	2.15	8.28	2.86	1.71	2.10	2.91	1.94	1.33	1.75	4.59		2.73	
22. Steel erection — general		9.46	(X)10.20	6.80	18.29	11.71		3.54	14.68	(J)	5.00	36.29	14.86	6.76	7.00	10.51	(X)7.74	5.82	5.95	12.98		8.91	
23. Steel erection — structural		13.21	(X)16.70	10.84	21.96	11.71		3.54	22.08	25.39	5.00	45.82	22.06	9.58	8.33	11.79	(Z)	8.12	7.14	19.52		8.46	
24. Steel erection — interior ornamental		2.45	(J) (X)	1.89	4.51	2.21		1.75	4.99	5.94	3.25	8.83	4.00	2.02	2.38	4.02	1.73	1.54	1.75	4.57		3.58	
25. Steel erection — dwellings 2 stories or less		6.58	(X)7.20	4.79	14.92	5.22		1.01	10.31	12.19	5.00	22.63	10.43	3.90	5.46	(Z)	5.72	3.87	4.17	9.53		5.58	
26. Steel sash and door		2.34	(X)3.50	1.79	5.34	2.11		1.75	4.72	3.55	5.00	8.35	3.54	1.93	2.24	3.79	1.73	1.45	1.66	(J)		3.73	
27. Tile marble or stone setting interior		1.13	1.75	.87	3.43	.96		.58	2.23	2.10	.65	3.74	1.74	1.00	1.10	1.66	1.95	.74	.81	1.62		1.26	
28. Watchmen and timekeepers (H)		2.45	(J)	1.87	7.38	2.21		.87	4.97	5.45	(F)	8.69	3.46	2.12	2.39	(Z)	2.29	1.56	1.84	4.69		3.94	
29. Waterproofing: Application by means of brush		2.85	(X)5.30	2.07	8.17	1.82		3.07	4.10	6.67	(J)	7.57	4.22	2.34	1.88	2.48	1.94	1.71	1.42	5.13		2.07	
Application by means of trowel (Int.)		2.11	2.85	1.57	5.17	1.59		3.07	3.95	5.72	(J)	7.08	3.24	1.73	1.65	2.84	3.09	1.30	1.43	4.04		2.42	
Application by means of trowel (Ext.)		2.86	4.30	1.50	5.97	1.31		3.07	4.13	5.83	(J)	6.29	2.12	1.39	1.48	3.66	1.92	2.04	1.10	4.48		2.24	
Application by means of pressure gun		4.42	(X)5.20	2.31	(X)6.29	2.22		3.07	5.96	6.69	(J)	7.20	5.99	2.34	1.97	3.66	(X)3.11	2.21	1.98	5.15		3.19	
30. Wrecking		14.17	(X)21.30	10.95	Z	11.59		4.43	27.52	32.43	(J)	44.82	23.63	11.21	11.20	26.39	21.59	8.91	10.30	24.93		18.13	

Notes: (A) Special rates for government projects. (B) Includes erection of forms. (C) Includes blasting, but not caisson or coffer dam work. (D) Special rates for occupational disease. (E) Compensation must be insured in monopolistic State Fund. (F) Assign operation to Governing Classification. (G) Operations specified as hazardous by law must be insured in State Fund. (H) Not avilable if general contractor is conducting operations at job. (I) Painting of bridges and steel structures rated as steel erection. (J) Rate avilable only on application to Company. (K) Wrecking of structures based on Cubic Content. (L) State rate revision pending. (M) Ohio State Plan: Workmen's Compensation, The Industrial Commission of Ohio, Actuarial Section, Columbus, Ohio. (Z) Not available in this State. (X) Special Classification wordings. (Y) These now must give Performance bond or other security of $500, and $3,000 Indemnity in either cash, U. S. Treasury bonds or surety form. Wilful failure or negligence to give security subject to $500–$5.000 fine.

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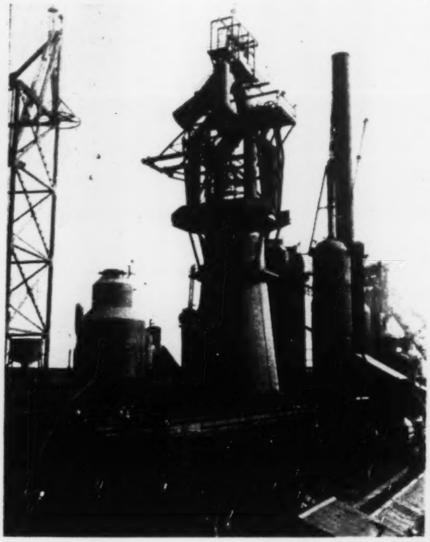
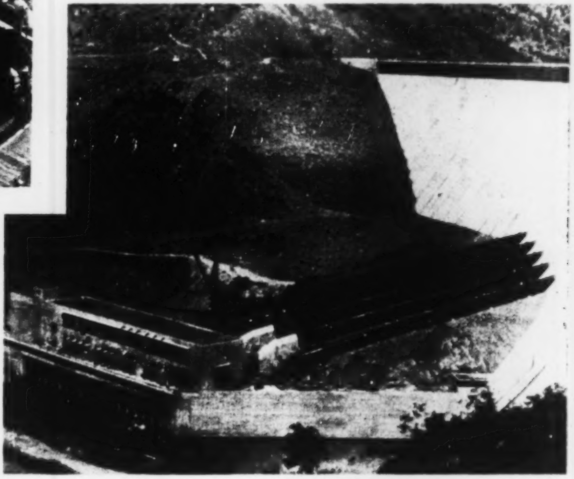
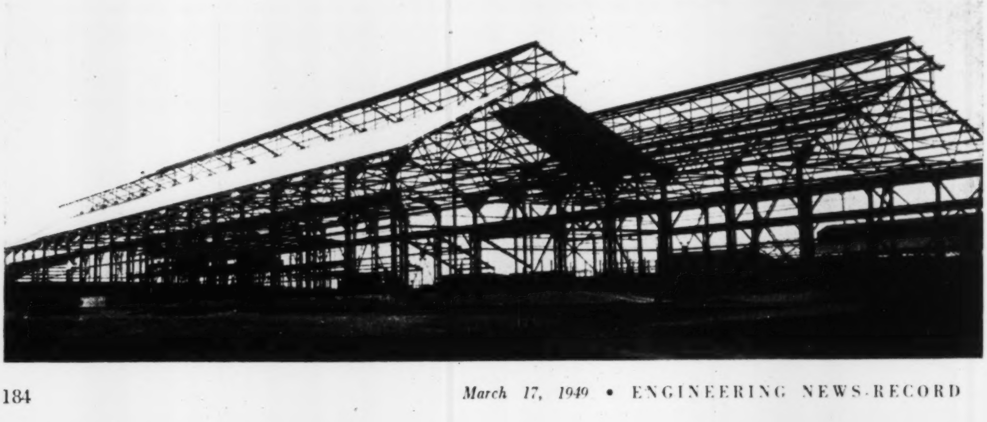


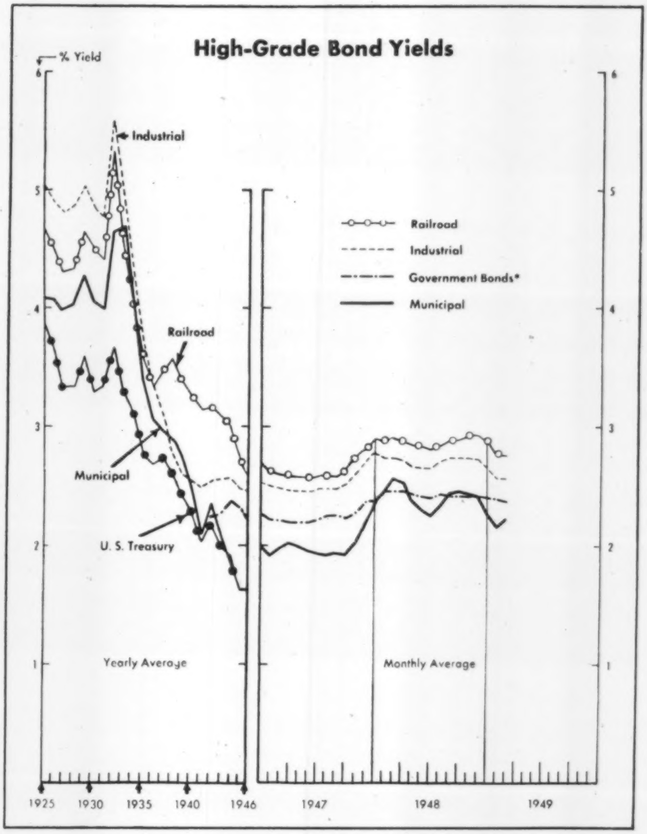


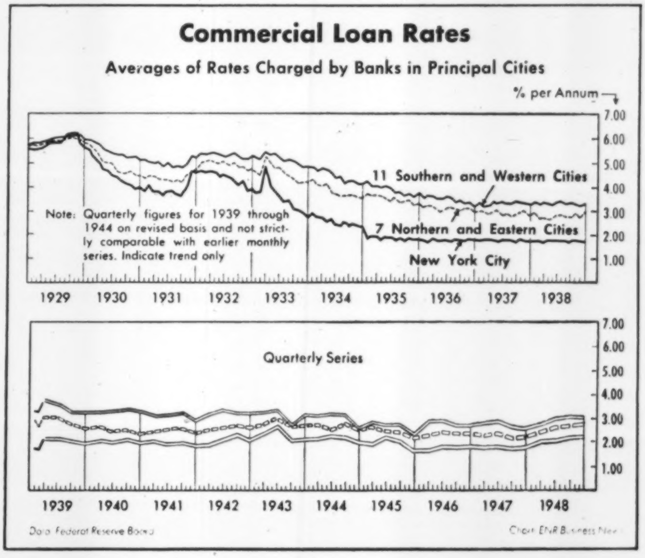
ABOVE—While a new Blast Furnace was being erected, the old furnace continued to produce pig iron. It was then dismantled and the new furnace was moved 112 ft. onto the old foundation.

RIGHT—Eichleay recently undertook the completion of the installation of penstocks at Shasta Dam, second largest dam in the world. Progress is shown in photo.

BELOW—Erection of Structural Steel to house new Morgan Rod Mill, also mechanical erection of equipment at plant of Colorado Fuel & Iron Co., Pueblo, Colorado.




High-Grade Bond Yields


Commercial Loan Rates

Averages of Rates Charged by Banks in Principal Cities

Note: Quarterly figures for 1939 through 1944 on revised basis and not strictly comparable with earlier monthly series. Indicate trend only

Data: Federal Reserve Board

Chart: ENR Business News

Cost of Financing

More securities were sold in 1948 to finance new construction than ever before on record. They were sold at interest rates or yields close to prewar rates which were higher than those prevailing for war years through previous postwar years.

State and municipal bonds sold at yields averaging 2.40 percent, 19 percent higher than in 1947 and 46.5 percent above the 1946 record low.

High grade industrial bond yields averaged 2.70 percent, a 7 percent rise over 1947 and 10.5 percent above the 1946 record low.

Public utility bond yields in 1948 averaged 2.83 percent. This was 9 percent higher than the 1947 average and 13 percent above the 1946 low.

Yields of railroad bonds averaged 2.89 for 1948. This was 10 percent above the 1947 average and 11 percent higher than 1946 record low averages.

In January and February 1949, these average yields were consistently lower than the 1948 averages.

Bond Yields—Percent

	Govt.† (1)	U. S. Treas. (2)	Municipal (3)	Industrial (4)	Pub. Util. (5)	Railroad (6)
1933		3.31	4.71	4.98	4.69	4.55
1934		3.12	4.03	4.28	4.19	4.01
1935		2.79	3.41	3.73	3.59	3.58
1936		2.69	3.07	3.34	3.38	3.31
1937		2.74	3.10	3.16	3.22	3.45
1938		2.61	2.91	2.82	2.99	3.60
1939		2.41	2.76	2.64	2.83	3.39
1940		2.26	2.50	2.57	2.75	3.26
1941		2.05	2.10	2.50	2.69	3.16
1942	2.27	2.09	2.36	2.54	2.71	3.17
1943	2.29	1.98	2.06	2.55	2.63	3.10
1944	2.38	1.92	1.86	2.58	2.64	3.01
1945	2.34	1.66	1.67	2.50	2.59	2.75
1946	2.19	Disc	1.64	2.44	2.50	2.59
1947	2.24		2.01	2.52	2.59	2.62
1948	**2.43**		**2.40**	**2.70**	**2.83**	**2.89**
1948						
J	2.44		2.45	2.72	2.85	2.86
F	2.44		2.55	2.72	2.86	2.88
M	2.44		2.52	2.70	2.83	2.87
A	2.44		2.38	2.67	2.78	2.85
M	2.42		2.31	2.66	2.77	2.83
J	2.41		2.26	2.66	2.77	2.81
J	2.44		2.33	2.70	2.81	2.85
A	2.43		2.45	2.74	2.88	2.89
S	2.43		2.46	2.74	2.86	2.90
O	2.43		2.45	2.74	2.87	2.92
N	2.43		2.42	2.73	2.88	2.93
D	2.42		2.26	2.65	2.84	2.88
1949						
J	2.40		2.15	2.58	2.77	2.78
F	2.38		2.23	2.58	2.75	2.77

(1) †Standard Statistics & Poors—aver. long-term government bonds, taxable. To replace the long-term U. S. Treasury bonds series discontinued after December, 1945.

(2) Aver. yield of long-term U. S. Treasury bonds, partially tax exempt, not due or callable for fifteen years. Federal Reserve Bulletin.

(3) Standard Statistics & Poors—aver. 15 high-grade long-term municipals.

(4) Standard Statistics & Poors—aver. A1 plus industrials.

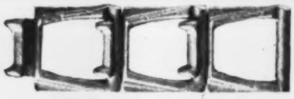
(5) Standard Statistics & Poors—aver. A1 plus public utilities.

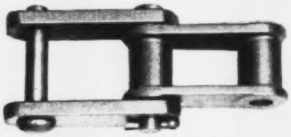
(6) Standard Statistics & Poors—aver. A1 plus railroads.

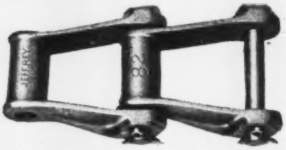
(3) Standard Statistics & Poors—aver. 15 high-grade long-term municipals.

(4) Standard Statistics & Poors—aver. A1 plus industrials.

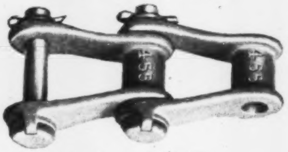
CHAINS, SPROCKETS and ATTACHMENTS


Detachable Link—Malleable Iron, SUPERMAL or PERDURO

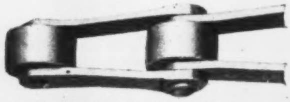

Combination—Malleable Iron or SUPERMAL Block Links and Steel side bars.

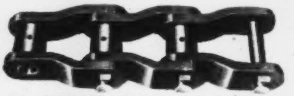


"H" Type Mill—Malleable Iron, SUPERMAL or PERDURO

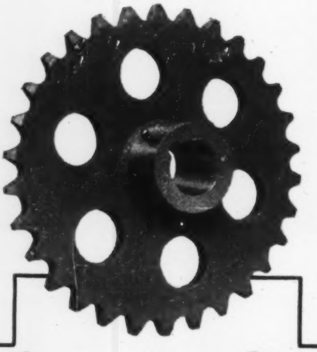


"400" Class Pintle


Malleable Roller—Malleable Iron, SUPERMAL or PERDURO

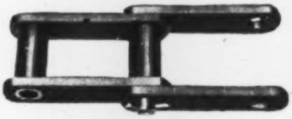

Steel Thimble Roller with straight or offset side bars

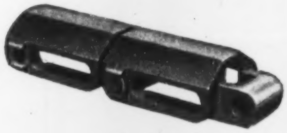
For every Elevating, Conveying and Driving need. Easy to select the right type and size from the broad Jeffrey line.



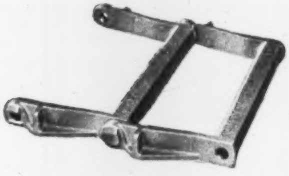
Long Pitch Steel Thimble Roller with plain or flanged rollers

"800" Class Steel Bushed


Steel Knuckle


Transfer

Steel Block in various types


"H" Type Refuse—Malleable Iron or SUPERMAL

A-1

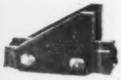
F-2

H-2

K-2

A-42 with C-wing

G-6


S-1

THE JEFFREY

MANUFACTURING COMPANY Established 1877
923 North Fourth St., Columbus 16, Ohio

Baltimore 2
Birmingham 3
Boston 16
Buffalo 2
Chicago 1
Cincinnati 2
Cleveland 13
Denver 2
Detroit 13
Harlan
Houston 5
Huntington 19
Jacksonville 2
Milwaukee 2
New York 7
Philadelphia 3
Pittsburgh 22
St. Louis 1
Salt Lake City 1
Scranton 3

Complete Line of Material Handling, Processing and Mining Equipment

Depreciation Schedule— U. S. Bureau of Internal Revenue

Depreciation is no longer a word limited to the vocabulary of accountants. Engineers and contractors are concerned with it because as taxes increase and construction costs rise, the rate at which facilities can be charged off to depreciation reserves influences whether building will be undertaken and when.

Because depreciation allowances are so important, Congress is hearing more and more about them, and pressure is building up for liberalization of the government's policy.

Industry is generally making up the difference between reserves and costs of new plants and equipment from profits. And it is of course, paying taxes on those profits. This presents a serious problem because industry is faced with the problem of financing huge expansion and improvement programs. McGraw-Hill's survey of "Business' Needs for New Plant and Equipment", reported in *Engineering News-Record* January 20, shows that American industry has plans now for investing some $55 billion in new plants and equipment in the next five years.

This puts a squeeze on many companies. They are short of cash because their depreciation reserves are providing only perhaps 50 percent of the cost of replacement.

Industry leaders, such as Ben Moreell, chairman of the board and president, Jones & Laughlin Steel Corp., are seeking a change in tax policy to relieve the squeeze. They are asking that companies be allowed to depreciate new equipment at an accelerated rate. Mr. Moreell, for example, proposes that companies be allowed to write off up to one-half of equipment costs within one to five years, and that they should be allowed to deduct this rapid amortization from taxable income. To safeguard the Treasury, he suggests that companies be allowed to limit amortization in any one year to no more than half their taxable income before the amortization is deducted.

The decision to build or not to build is influenced by the length of time it will take for the new facilities to pay off. The survey of "Business' Needs for New Plants and Equipment" by McGraw-Hill, showed that four out of five manufacturing companies (80 percent) expect a new building to pay for itself in 15 years or less. More than 60 percent of them insist that new construction pay off in 10 years or less. Now the "probable useful life" of such new construction might be much longer.

The schedules herewith give the "probable useful life" of buildings and equipment in years. Depreciation rates are calculated from the years of useful life on a straight-line basis. If, for example, the probable life is 10 years, the equipment may be depreciated at the rate of 10 percent a year. If 25 years, the rate is 4 per cent.

In January 1942 the U. S. Bureau of Internal Revenue revised its 1931 schedule of probable useful life and depreciation rates. Items of direct interest to civil engineers are shown in revised Schedule "F", and include those quoted in the following list.

BUILDINGS

	Bldg Only	Bldg. & Equip.		
	Est. Tot. Life	Composite rate (percent) Type of construction		
	Years	Good	Average	Cheap
Apartments	50	2½	2½	3
Banks	67	2	2	2½
Dwellings	60	2	2½	3
Factories	50	2½	2½	3
Farm bldgs	60	2	2	2½
Garages	60	2	2½	3
Grain elvtrs	75	1⅓	2	2½
Hotels	50	2½	2½	3
Loft bldgs	67	2	2	3
Mach. shops	60	2	2½	3
Office bldgs	67	2	2½	3
Stores	67	2	2	2½
Theaters	50	2½	3	3½
Warehouses	75	1⅓	2	2½

BUILDING EQUIPMENT

	Years
Air conditioning syst—	
Over 20 tons	20
5 to 15 tons	15
Under 5 tons	10
Air washer. (See Dehumidifier.)	
Compressors—	
Refrigerating	20
Air for pneu. controls	20
Condensers—	
Shell and tube	20
Double pipe	20
Evaporation	15
Coolers, water—tank & coil or shell & tube	20
Dehumidifier	10
Drums, purge or surge	20
Ducts and other sheet metal work.*	
Fans	15
Filters, air, oil, self-cleaning	20
Dry cleanable	10
Gauges	15
Grilles and registers—	
Anemostats	20
Grilles & registers—	
Wall type	20
Ceiling	20
Window units	15
Placques	20
Santrols.*	
Heaters—boiler	
Oil burner & tank	20
Booster heaters	20
Electric heaters	15
Finned tube, steam !water cleanable tube	20
Prehtrs. and rehtrs.	20
Water heaters, open or closed type	20
Insulation—Cork, cold pipes & tanks	20
Magnesia, hot pipes	15
Wool felt	20
Asbestos	15
Louvres & screens, Copper	25
Steel	15
Manometers	15
Motors—	
Synchr. & exciter set	20
Induc., indoor	20
Induc., weatherproof for outdoor	20
Piping, refrig & other	20
Pumps—	
Chilled water	20
Condenser water	20
Condensate	20
Dehumidifiers	22
Evap. condenser	15
Sump	25
Well	25
Receivers, refrigerant	25
Regulators, suction or static pressure	5
Silicia gel beds	15
Spray pond	15
Switchbd, elec. panel	20
Thermometers, room type or recording	15
Tower, cooling	15
Valves—Relief	20
Automatic expansion and by-pass	5
Solenoid	15
Water regulating	20
Ammeters	15
Clocks	15
Clocks, watchman	15
Compressors, air & vacuum	20
Electric clock systems:	
Clocks, time	20
Conduits, fittings & wiring. (See light. sys.)	
Motors & gener	20
Switch equipment—	
Boxes.*	
Switch parts	20
Elevators:	
Freight	25
Passenger	20
Fire equipment:	
Fire alarm systems	25
Movable equipment	20
Sprinkler system.*	
Guards, machine	25
Heaters, electric	10
Heaters, gas	15
Heating systems:	
Boilers & furnaces	20
Burner equipment—	
Gas	16
Oil	10
Radiators	25
Lighting systems:	
Conduits and fittings.*	
Wiring	20
Fixtures	15
Miscellaneous facilities:	
Awnings	5
Doors, louvre, vent	15
Incinerators	14
Safes and vaults.*	
Screens, window	10
Shades	5
Venetian blinds	8
Plumbing:	
Faucets & flush valves	15
Bath tubs, lavatories, toilet bowls, etc	25
Pipes—	
Brass or copper.*	
Iron, cold-water	25
Iron, hot-water or steam	20
Sewer, CI. or vitr.*	
Valves—	
Brass body, water or steam.*	
Iron body, water or steam	20
Pumps:	
Suct., pres. & sump	13
Roofs:	
Asbestos	25
Asphalt and tar (prepared)	15
Galvanized iron—	
Light or cold dipped	15
Heavy or hot dipped	20
Tar & grav. (5-ply)	20
Tarred felt	10
Copper, slate, tile, tin.*	
Starters, electric	20
Switchboards, elect	25
Tanks and vats, water:	
Metal	25
Wood	15
Telephone equipment:	
Conduits and fitting.*	
Wiring & fixtures	20
Tools, small, misc	5
Transformers	25
Trucks, conveyance (within building)	10
Trucks, lift	15
Voltmeters	15
Welfare equip.:	
Athletic	10
Cafeteria	10
Hospital & first aid	10
Police and fire	10
Wells & well pumps	25

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*Life of building.

WATER SUPPLY

	Years
Impounding dams	150
Springs and wells	100
Infilt. galleries & tunnels	100
Collection conduits and reservoirs	75
Mains, cast iron:	
4-inch and less	50
6-inch	65
8 to 10-inch	75
12-inch and over	100
Settling basins	50
Coagulating basins	50
Filters	50
Steam engines	30
Diesel type engines	25
Pumps	50
Stand pipes	50
Meters	30
Hydrants	50
General office equip	19
General shop equip	29
General store equip	20
Laboratory equip	10

BRIDGES

	Years
Conc. & steel or masonry, large	100
small	75
Steel, heavy	50
Steel, light	40

ELECTRIC UTILITIES

Steam Production

	Years
Struct. and impvts	50
Boiler plant equip	28
Engines and engine driven generators	30
Turbo-generator units	30
Acces. elect. equip	28
Misc. pwr plant equip	28

Hydraulic Production

	Years
Struct. and impvts	75
Reservoirs, dams and waterways	150
Waterwheels, turbines and generators	35
Acces. elect. equip	35
Misc. power plant equip	35
Roads, railroads and bridges	100

Transmission Plant

	Years
Struct. and impvts	45
Station equipment	28
Towers and fixtures	50
Poles and fixtures	33
Overhead conductors and devices	50
Underground conduit	75
Underground conductors and devices	40
Roads and trails	60

Distribution Plant

	Years
Struct and impvts	45
Station equip	28
Storage battery equip	20
Poles, towers & fixt	35
Overhead conductors and devices	33
Underground conduit	60
Underground conductors and devices	40
Line transformers	28
Services	28
Meters	28
Instals. on customers' premises	25
Street lighting and signal systems	22

ARTIFICIAL GAS

Production Plant

	Years
Struct. and impvts	50
Boiler plant equip	30
Other power equip	40
Benches and retorts	35
Coke ovens	35
Producer gas equip	33
Water gas gener. equip	33
Petroleum gas equip	33
Other gas gener equip	33
Coal, coke, and ash handling equipment	40
Gas reforming equip	33
Purification equip	33
Residual refin. equip	40
Other prod. equip	33

Distribution Plant

	Years
Struct. and impvts	45
Mains	80
Cast iron pipe—	
4 in. and less	50
6 in	65
8 to 10 in	75
12 in. and over	100
Steel pipe—	
4 in. and less	30
5 to 7 in	40
8 in. and over	50
Wrought iron pipe—	
¾ in. to 1½ in	33
2 to 2½ in	40
3 to 6 in	50
8 to 10 in	75
12 in. and over	100
Pump. & regulat. equip	35
Services	40
Meters	35
Meter installations	40
House regulators	40
House regul. instal	40
Other property on customers' premises	33
Other distrib. sys. equip	35

How long would you keep a machine that costs you a day's production every 3 days?

However new and shiny its paint, any portable compressor rated at only 60, 105, 160, 210, 315 or 500 ft. is essentially a 1932 model, designed for the air tools used in 1932.

It delivers only enough air to maintain 70 lbs. pressure in a set of the big tools used today.

This is a costly deficiency because those same tools, at full 90 lbs. pressure, do 30% to 40% more work.

That's one extra day's production every 3 days. That's real money.

You get that full 90 lbs. pressure, and resulting increased production, with Jaeger "new standard" Air Plus Compressors.

Every Jaeger model is designed to deliver the correct, full amount of air needed to run today's tools at full pressure and maximum efficiency.

They are specifically engineered for these increased capacities, with much larger valves, port areas, intercoolers, air receivers and clutches, advanced-type force feed lubrication and balanced 2-stage compressor design. That's why they are able to compress, cool and deliver more air easily, economically, without building up heat, losing efficiency at altitudes or shortening engine or compressor life.

They operate at the conservative, economical speeds of today's gas and diesel engines — the same speeds used in other well-known compressors that deliver from 15% to 20% less air.

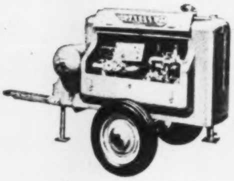
When you need less air, they slow down under "Fuel Miser" automatic, fully graduated control — match or beat the fuel economy of others. No penalty for extra capacity.

Is it good business for you to keep a 1932 model compressor on 1949 work—at a steady loss as great as one day's production for every three you work—plus a bigger loss later thru "old model" obsolescence?

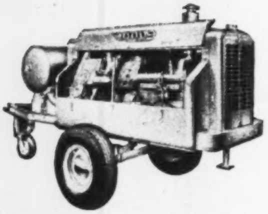
Ask any Jaeger user. Better yet, go to the nearest distributor who sells and rents "new standard" Air Plus compressors and let him prove this production increase—*on your job.*

THE JAEGER MACHINE CO.
Columbus 16, Ohio

Full 90 lbs. pressure for all tools



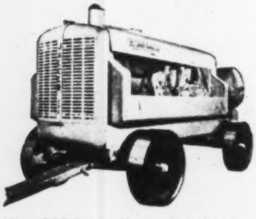
New 75 for a heavy breaker.



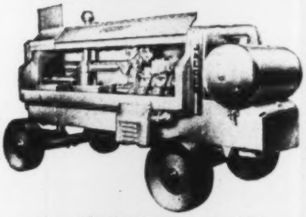
New 185 for 3 heavy duty breakers, 2 medium or 1 heavy rock drill.

New 365 for 2 medium or 1 heavy wagon drill plus hand-held drill.

New 125 for 2 heavy or 3 medium breakers or heavy rock drill.



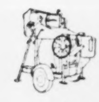
New 250 for medium wagon drill or an additional hand-held tool of any size.



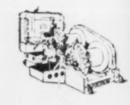
New 600 for 2 heavy wagon drills plus a hand-held drill.

JAEGER
engineered equipment
COMPRESSORS • DIAGONAL SCREED FINISHERS
SCREW SPREADERS • BITUMINOUS PAVERS

PUMPS



MIXERS



HOISTS

Construction Equipment Depreciation Schedule

In January 1942 the U. S. Bureau of Internal Revenue revised its 1931 Schedule F of probable useful life and depreciation rates allowable for income tax purposes. Annual depreciation rates are computed on a straight-line basis. For example, on a probable useful life of ten years, annual depreciation is 10 percent; on 25-yr. life, annual depreciation is 4 percent. Probable useful life is shown below:

CONSTRUCTION EQUIPMENT

	Years
Automobiles: Light	2
Medium 3; Heavy	5
Backfillers, power:	
Light 3; Medium	5
Heavy 6; Tractor	5
Barges:	
Steel 30; Wood	25
Batcher plants:	
All steel, demount	10
Steel frame, wood bin	10
Stationary	14
Wood frame and bin	7
Batch, meas. devices	4
Benders, bar	5
Bending blocks	10
Bending mach.: Angle	15
Pipe & Rail	10
Bins: Steel, concrete	6
Steel 12; Wood	8
Bin frames, steel	6
Blacksmith shop, port	4
Blocks, pulley, differential	6
Blowers, mechanical	10
Boilers: Upright	7
Locomotive	15
Stationary	20
Borers (wood), port	3
Boring apparatus, test	10
Boxes, mortar & batch	3
Brakes: Bending	10
Cornice (sheet metal)	22
Breakers, pav., pneu	3
Buckets: Cableway	6
Clamshell 6; Concrete	5
Elevator	5
Orange peel	6
Bail, pivot turnover	5
Scraper or drag line	6
Buggies: Concrete	3
Timber	3
Building, job office or storage. (Life of job)	
Bulldozers:	
Gradebuilders	8
Tractor	4
Burner equip., gas & oil	12
Cables, wire	4
Cableways, cable only	3
Cableway carriage	5
Camping equip	3
Capstans, electric	10
Cars: Ballast spreader	10
Batch box, steel	5
Boarding and tool	20
Concrete	8
Derrick, bridge	10
Dump, steel 8; wood	6
Flat, steel 12; wood	10
Hand, Hopper, Scale	10
Skip hoist 10; Tank	20
Carts, concrete	3
Carts, tool (steel)	4
Cement gun machines	4
Chains:	
Hawsers and lines	6
Power, transmissions	5
Channelers, rock	6
Chipping and calking tools, pneumatic	3
Chutes, con., gravity	2
Clamps, column form	5
Clean mach. for exterior of bldg., steam or sand	15
Compressors:	
Belt driven	10
Electric, portable	8
Gasoline, portable	6
Motor-truck unit	5
Steam portable	6
Conc. mach., pneumatic	5
Concrete mixers: Elec.	5
Gasoline, 3's, 5s, 7s	3
Gasoline, 10s, 14s	4
Gasoline, 21s, 28s	5
Paving, gas, steam	8
Concrete mixers: *(cont'd)*	
Truck mounted	5
Controllers, motor	12
Conveyors:	
Belt, elevating—	
Portable	3
Stationary	6
Bucket	6
Cable—Drag	6
Monorail	15
Chain, portable	6
Portable 5; Scraper	6
Cranes:	
Bridge and cantilever	20
Crawler—Electric—	
2½, 5 tons	5
10, 15 tons	7
20 tons and over	9
Gas—2½, 5 tons	5
10, 15 tons	9
20 tons and over	12
Locomotive gas	7
Steam—2½, 5 tons	6
10, 15 tons	10
20 tons and over	12
Locomotive	10
Dragline	10
Universal (gas, 2½ to 5 ton), mounted on 10-ton truck	6
Craneways: Steel	15
Wood	10
Crushers, rock: Port	8
Stationary	10
Cutters: Bar, power	5
Corru. iron, hand	10
Derricks: Boat	10
Circle swing, hand	8
Crab—hand 16; power	10
Guy—Steel, 12; Wood	8
Stiffleg—steel 12; wood	8
Diggers, clay, pneu	3
Drag lines:	
Electric—½, ¾ cu. yd.	6
1, 1¼, and 1½ cu. yd.	8
2 cu. yd. & over	10
Gasoline—½, ¾ cu. yd.	5
1, 1¼ & 1½ cu. yd.	9
2 cu. yd. and over	12
Steam—½, ¾ cu. yd	6
1, 1¼ and 1½ cu. yd.	10
2 cu. yds. & over	12
Dredges: Clamshell	16
Dipper 8; Hydraulic	20
Pipe	10
Drill boats	12
Drill points, well	5
Drills: Airdrifter	3
Elec. or pneu., hand, for wood or metal	5
Hand, electric	3
Rock, electric	3
Jackhammer	3
Steam	5
Traction, well	7
Tripod	7
Tunnel carriage	5
Well	10
Drums for oil (steel)	10
Elevators:	
Bucket, stationary	6
Cage (steel tower)	5
Engines:	
Blowing 12; Fire	7
Gas 10; marine 20; oil	20
Plumbing 14; Steam	11
Excavators:	
Cableway, complete	4
Trench, gasoline—	
7-ft. and 12-ft. depth	6
18-ft. depth	8
7-ft. and 12-ft. depth	8
18-ft. depth	10
Trench, vert. boom	5
Wheel or ladder type	5
Extinguishers, fire	3
Fans, exhaust	15
Finishing machines	4
Floats, bridge (steel)	5
Forges, gas or oil	10
Forms:	
Conc. (metal pans)	5
Conc., supports, adj.	4
Steel, for—	
Pavements 4; Pipes	3
Roads 4; Walls	5
Tunnels & conduits	4
Furnaces, metal melting:	
Coal fired 10; Electric	12
Gas or oil	7
Generator sets:	
Steam engine	12
Turbine, headlight or floodlight	4
Gin poles (steel)	10
Graders: Blade, road—	
7, 8 foot blade	4
9, 10 foot blade	5
over 10-foot blade	8
Elevating	8
Form, subg. planers	6
Rooters, wheel	5
Grinders: Metal surface	15
Saw filers & setters	14
Surface, concrete	4
Hammers: Electric	3
Pneumatic riveting	3
Heaters, asphalt, tar, and pitch kettles	4
Helmets, gas and diving suits and equip	10
Hoists: Chain	6
Air, electric, or steam	8
Elec. monorail or post	5
Gas 6; Hand power	8
Elec. 8; Steam	12
Holders on pneumatic	4
Hose: Fire, linen or rubber lined cotton	5
Metal, flexible	10
Oil 5; Reel or cart	10
Rubber, air, steam or water	10
Inundators, batch	4
Jacks: Hyd. 8; Rail	25
Rachet 8; Screw	5
Push and pull	3
Jibs, steam	17
Jointers, bench, electric, steam or gas	5
Ladders: Steel	3
Ladles, metal	7
Lathes: Metal working	15
Woodworking	17
Levee construction	
Drag lines	8
Shovels	8
Tower excavators	12
Life-saving equipment	10
Light plant	4
Lighters	22
Loaders, bucket:	
Crawler and Portable	5
Stationary	6
Locomotive battery	4
Locomotives, industrial:	
Diesel 10; Electric	16
Gas—Up to 10 tons	8
10 to 20 tons	15
Over 20 tons	20
Steam—	
Up to 10 tons	8
10 to 20 tons	18
Over 20 tons	20
Locomotives, std. gage	30
Magnets, lifting	15
Mixers: port. mortar	3
Less than ½ cu. yd	6
Over ½ cu. yd	8
Caterpillar	8
Motors:	
AC and DC—Large	12
Medium 10; Small	8
Hydraulic 5; Pneu	5
Mowers, right of way	5
Pile drivers: Railroad	10
Barge 8; Track	12
Steam, on skids	10
Pile hammers, steam or air: Heavy	10
Light 4; Medium	5
Pipe: Black or galv.	4
Wood	5
Wood & steel comb	6
Pipe lines & fittings, for floating dredges	10
Pit and quarry plants	6
Planers: Metalworking	15
Woodworking	20
Plows: Furrow 3; Rooter	6
Presses, drill	12
Pumping units:	
Electric—Centrifugal, Diaphragm, Piston, Gas—Centrifugal, Diaphragm	6
Hwy. contr's pump	4
Piston	5
Steam, centrifugal	10
Pumps: Air lift	10
Centrifugal, Humdinger, Impulse	6
Hydraulic 15; Oil	10
Pumps: Air lift *(cont'd)*	
Steam piston unit	6
Testing for pipe lines	15
Punches, hydraulic	20
Punches for steel, pwr.	15
Racks, storage, for pipe and steel:	
Steel 20; Wood	15
Rails, steel	10
Razing equip., for bldgs.	8
Reamers: Elec., Pneu	3
Riveters, pneumatic	5
Rollers:	
Conc. finishing (steel)	10
Road, gas, steam	10
Rolls, ridge	5
Sand-blast outfits	10
Sawmills, portable	10
Saws: Band, cut-off and rip, power	10
Hand, Elec. & pneu	3
Saws and woodworkers:	
Steel frames 10; Wood	5
Scales, large, track and wagon	20
Scarifiers: Attachments	4
Blocks, steerable	5
Drag, all steel	4
Grader type	4
Scrapers: Blade, carryall	6
Fresno or Morman	2
Rotary 4; Slip 2; Wheel	5
Screens and bunkers, for gravel pits only	5
Screens, revolving	6
Sharpeners, drill	8
Shears, for steel, hand	10
Shores, adjustable	4
Shovel attach	6
Shovels: Elec. or gas., crawler or wheel—	
½, ¾ cu. yd	5
1, 1¼, 1½ cu. yd	6
2 cu. yd. and over	8
Steam, craw. or wh—	
½, ¾ cu yd	7
1, 1¼, 1½. cu. yd	8
2 cu. yd. and over	10
Railroad, steam	10
Tunnel	4
Spouting plants, comp., concrete	4
Spraying equip., paint	12
Spreaders, stone:	
Hopper wagon	5
Steel box	5
Switches: Portable	4
Stationary	5
Tampers, backfill, pneumatic	3
Tamping machines	10
Tanks: Gasoline, storage and Relay	6
Water or air, storage (steel)	10
Water storage (wood)	14
Tarpaulins and tents	3
Thread. cut. mach., pipe	10
Tongs, chain	4
Towers: Cableway—	
Steel 6; Wood	3
Steel boom with counterweights	5
Tractors: Electric— 3-ton 3; 5-ton 5; 10-ton 6; 20-ton	8
Gas or steam— 3-ton 4; 5-ton 6; 10-ton 8; 20-ton	10
Trailers:	
Dump—Steel or Wood	10
Platform, wood	4
Drop plat., hvy. duty	5
Transformers, car	10
Trench. mach. (See Excav.)	
Trucks auto: General purpose or dump—	
½-¾ cu. yd	3
1-1¾ cu. yd	5
2 cu. yd. & over	8
Tugs, screw-propelled, steam or gas	25
Vises	5
Wagons: Dump—	
Steel or Wood	6
Road oilers, tank, steel	10
Tank or sprinkler— Steel 10; Wood	8
Washers, gravel	3
Welders, acet. or elec.	10
Wheelbarrows	2
Winches, elec. and pneu.	10
Wire and cables: Elec.	6
Flexible, steel armored	8

Construction Equipment Ownership Expense

Fixed expense per working month of owning construction equipment, expressed in percent of cost new, is available through the Associated General Contractors of America. The edition of this AGC Manual now in use is Contractors' Equipment Ownership Expense, Revised and Enlarged, 1938 with Supplement 1944.

This shows an "average annual expense" in "percent of capital investment *without* field repairs" and *without* fuel, lubricants and other operating expense. It includes no allowance for profit or ordinary on-the-job repairs. The selected prices shown as characteristic of the various types and sizes of equipment do not apply today, but the percentages to be charged off annually for Depreciation, Overhauling, Major Repairs, Painting, Interest, Taxes, Storage, Insurance, do apply now. Average use is shown in months per year. Thus the Expense per Working Month is obtained by dividing Average Annual Total Ownership Expense by the number of months worked.

Ownership Expense for two of eight size ranges of diesel crawler tractors, for example, is shown as:

Average Annual Expense Percent of Capital Investment Without Field Repairs

	Drawbar hp. from 20 to 33 hp.	Drawbar hp. from 89 to 135 hp.
Depreciation	33%	25%
Overhauling, Major Repairs, Painting	20%	20%
Interest, Taxes, Storage, Insurance	11%	11%
Total Ownership Expense	64%	56%
Average Use, Months by Year	9 mo.	8 mo.
Expense per Working Month	7.1%	7%
Assumed Aver. Price	$2,500*	$8,100*
Expense per Working Month	$175*	$565*

* 1944 prices. A new manual computed on current prices is planned when prices stabilize possibly late in 1949.

Construction Equipment Rental Rates

Equipment rental rates vary greatly throughout the United States, depending upon local practices and conditions. A schedule of prevailing rental rates, representing as nearly as could be determined an over-all average of rental rates throughout the United States for specific prices of equipment has been compiled for informational purposes only by the Rental Committee Associated Equipment Distributors, Chicago, Ill. Selected items from the fourth edition prepared in 1947 were reported in ENR, May 27, 1948, page 161. A new schedule is now being worked out, but is not ready for publication as this goes to press. Rates are reported per month, per week, per day.

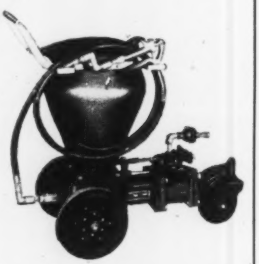
it's easier to *keep machines always in top "working trim"* with ALEMITE LUBRICATION EQUIPMENT

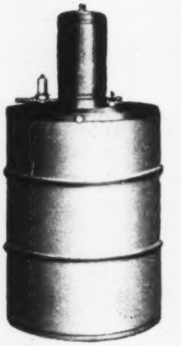
Modern Alemite Equipment is rugged and dependable, engineered specifically for heavy-duty service on all types of construction jobs under all temperature conditions. Assures safe, positive lubrication that makes construction equipment produce more profitably, last longer. Prevents waste and contamination of lubricants . . . saves you time, work, and money.

Illustrated here are but four models in the complete line of Alemite Lubrication Equipment for the construction industry. For full information on these, or any other equipment you need, write Alemite, 1821 Diversey Parkway, Chicago 14, Illinois.

Alemite "Rock Crusher" High Pressure Pump

This husky air-operated pump makes light work of the hardest lubrication jobs. Handles a volume delivery of heavy fibrous lubricants even at low temperatures. Improved helix arm and worm gear feed assure positive priming of heaviest greases. Builds 5000-pounds grease pressure.



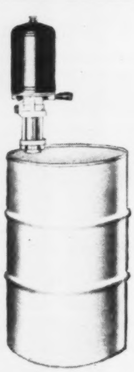


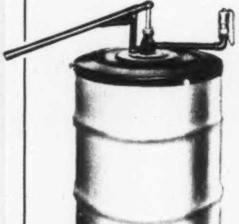
Alemite Barrel Pumps Powered by Rugged Air Motors

Built to handle the toughest lubrication jobs with ease. Pump lubricants directly from original drums at pressures up to 8000 lbs. Serve one or more outlets. Feature "Dynamic" Primer which adds positive mechanical priming, permitting easy handling of light, heavy and fibrous lubricants.

Alemite Air Operated Heavy-Duty Oil Pumps

Designed for fast, large-volume dispensing of oil or fluid gear lubricant right from original drum—without waste or contamination. Ideal for filling engine crank cases, transmissions and other large oil reservoirs. Fits directly into bunghole of 54-gallon drum.





Alemite Loader Pumps

For quick, easy filling of hand guns without waste or contamination. Prevent the air pockets which result from hand-and-paddle loading methods. Save $3\frac{3}{4}$ man hours for every 100 lbs. of grease used. Model shown here fills guns directly from original 100-lb. lubricant drums.

***FREE**—Interesting illustrated booklet, "Correct Lubrication in the Construction Industry." Packed with valuable facts on the lubrication needs of various machines, proper selection of lubricants, proper handling and application of lubricants. Send now for your free copy.*

Another Product of
STEWART
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Modern Lubrication Methods That Cut Production Costs

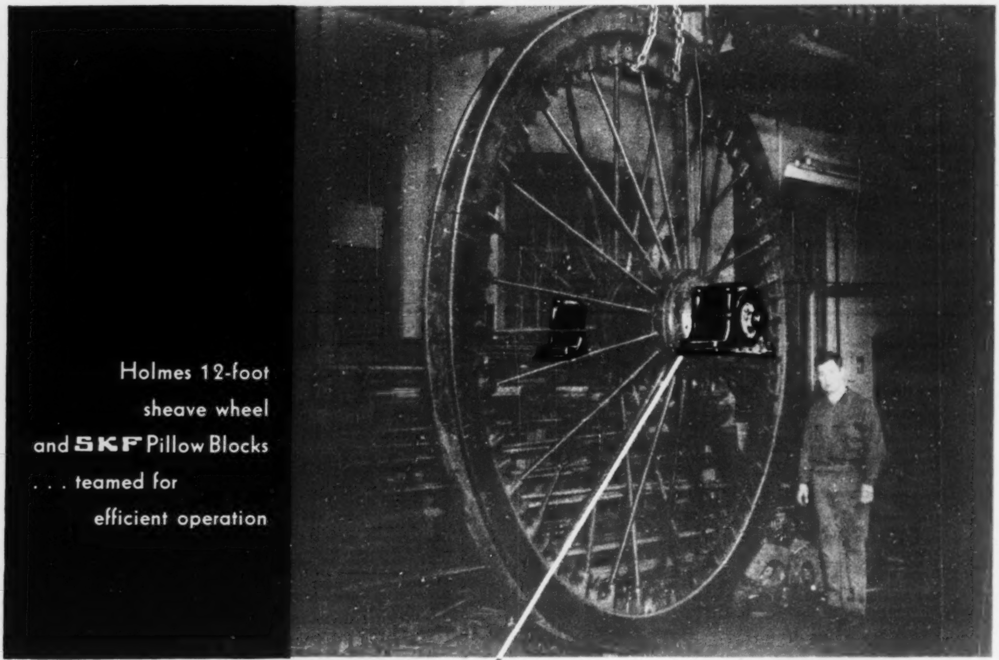
Itemized Cost Analyses of Fresno Hospital

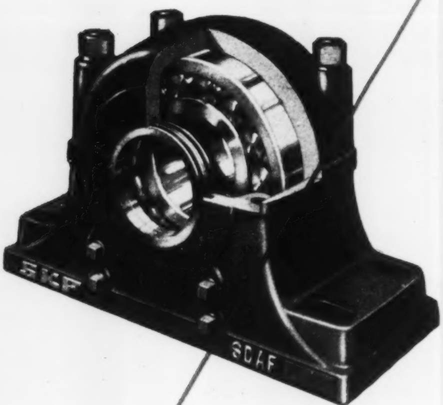
Unit prices set for payment purposes for the Veterans Administration, 250-bed, general medical hospital at Fresno, California offer one of the most complete analyses of building costs ever published. The main construction contract was let August 12, 1947. The unit prices here reported cover not only this contract but also materials and equipment furnished, overhead, engineering and contingencies.

Design of the Fresno, VA hospital was described in detail in ENR, March 3, 1949, p. 58. Summarized here are those features that illuminate the unit prices.

Planning and construction of this hospital is under the supervision of the Sacramento district office, Corps of Engineers.

Item	Quantity	Unit Price	Total Cost
LAND	By V. A.		
SITE IMPROVEMENT	% constr. $	2.2%	$125,000
OUTSIDE UTILITIES	% constr. $	4.0%	230,737
BUILDINGS	% constr. $	93.8%	(5,369,363)
	2,993,678 cf	$1.79	
Main Hospital Bldg.	% constr. $	83.6%	(4,785,363)
	2,636,394 cf	$1.82	
Foundation & substructure	% bldg. $	3.6%	173,595
Building enclosure	% bldg. $	40.5%	1,937,502
Interior finish	% bldg. $	25.4%	1,215,575
Plumbing, piping & fixtures	% blds. $	4.5%	216,010
Heating & ventilating	% bldg. $	10.7%	510,200
Electrical wiring & fixtures	% bldg. $	6.8%	324,401
Elevators	% bldg. $	3.4%	164,450
Equipment (incl. installation)	% bldg. $	5.1%	243,630
GARAGE	91,200 cf	$0.58	53,000
APARTMENT HOUSE (A)	29,200 cf	$1.64	48,000
APARTMENT HOUSE (B)	29,200 cf	$1.64	48,000
MANAGER'S QUARTERS	30,654 cf	$1.70	52,000
NURSES' QUARTERS	55,900 cf	$1.40	78,000
ATTENDANTS' BARRACKS	31,000 cf	$1.45	45,000
BOILER HOUSE	90,130 cf	$2.88	260,000
	% constr. $	100%	$5,725,100
Total Construction Cost	2,993,678 cf	$1.91	
Site Improvement	% constr. $	2.2%	($125,000)
General site grading	25,900 cy	$0.46	12,000
Landscaping	20 acre	4,600.00	92,000
Fencing (wood)	800 lf	2.50	2,000
Open walks & trails (mostly 6′ wide)	8,333 lf	2.28	19,000
Outside Utilities	% constr. $	4.0%	(230,737)
Storm sew. (no piping, 1 catch basin)	lump sum		200
Road excavation, fills & drainage	lump sum		23,997
Road base course & surfacing	19,600 sy	2.17	42,440
Parking areas & hard standings	2,800 sy	2.00	5,600
Sew. collect. & disposal (0.075 MGD)	lump sum		17,000
Water supply, storage & distribution	lump sum		97,500
Water treatment plants	lump sum		2,500
Power & light distb. (1800 KW, substation in 401.79)	lump sum		22,000
Heating system, exterior (500 H. P.)	lump sum		11,100
Fuel oil storage & distribution	gal.	0.21	6,400
Gasoline & Lub. oil storage & distb.	gal.	4.00	2,000
Buildings	% constr. $	93.8%	(5,369,363)
Main hospital building (250 bed)	% constr. $	83.6%	(4,785,363)
Foundation & substructure	% bldg. $	3.6%	(173,595)
Excavation (earth, incl. backfill)	39,000 cy	1.74	67,850
Footings & foundation walls	2,260 cy	46.16	(104,325)
Forms	49,500 sf	0.90	44,550
Concrete	2,260 cy	19.00	42,940
Reinforcing steel	91 ton	185.00	16,835
Waterproofing & dampproofing	14,200 sf	0.10	1,420
Building enclosure	% bldg.	40.5%	(1,937,502)
Structural steel framing	1,800 ton	209.00	(376,200)
Furnish & fabricate steel frame	1,800 ton	146.65	263,976
Erect steel frame	1,800 ton	62.35	112,224
Miscellaneous iron & steel	lump sum		(102,460)
Sheet metal (general)	lump sum		12,000
Iron & steel	33 ton	620.00	20,460
Ornamental iron & steel	70,000 lb	1.00	70,000
Reinforced concrete	10,100 cy	91.83	(927,450)
Forms	760,000 sf	.80	608,000
Concrete	723,000 cf	0.75	204,750
Reinforcing steel	620 ton	185.00	114,700
Masonry walls and back-up	lump sum		(296,580)
Facing (anchor & adhesion T. C.)	75,500 sf	3.75	283,200
Back-up (mortar)	15,000 cf	0.60	9,000
Treatment concrete surfaces for plaster	7,300 sy	0.60	4,380
Partition walls (hollow tile)	21,500 sf	0.55	11,825
Exterior doors	23 ea	435.00	10,005
Exterior windows & glass	1,106 ea	156.31	(172,880)
Windows	1,097 ea	110.00	120,670
Skylights	3 ea	500.00	1,500
Glass & glazing	29,600 sf	1.10	32,560
Automatic vents	6 ea	250.00	1,500
Detention screens	90 ea	185.00	16,650
Roofing	376 sq	47.64	17,912
Weather protection	25,000 lf	0.89	22,190
Interior finish	% bldg. $	25.4%	(1,215,575)
Finished walls and ceilings	86,000 sy	4.80	(413,300)
Furring	72,000 sy	2.00	144,000
Lathing	72,000 sy	1.65	118,800
Plastering	86,000 sy	1.75	150,500
Movable partitions	10,880 sf	4.20	45,670
Accoustical treatment & installation	76,125 sf	0.80	61,125
Interior doors & windows	882 ea	143.96	(126,975)
Hollow metal doors & frames	25 ea	395.00	9,875
Kalamein doors & frames	32 ea	200.00	6,400
Shades & blinds	3,600 sf	3.25	11,700
Wood doors & steel frames	825 ea	120.00	99,000
Interior stone, tile & terrazzo	lump sum		(406,070)
Interior tile	142,600 sf	2.07	294,775
Terrazzo	32,300 sf	1.65	53,295
Structural glass	5,000 sf	4.00	20,000
Interior stone (marble)	lump sum		38,000
Floor topping & covering	149,600 sf	0.36	53,240
Trim & built-in wood features	lump sum		5,957
Painting (incl. exterior painting)	440,000 sf	0.13	56,981
Finish hardware	907 set	51.00	46,257
Plumbing, piping and fixtures	% bldg. $	4.5%	(216,010)
Water system	lump sum		(122,350)
Piping	lump sum		85,500
Fixtures & installations	670 ea	55.00	36,850
Sprinkler system	258 hd	62.64	16,160
Gas, air and other special systems	lump sum		19,000
Hot water generator (2700 gal. cap.)	2 ea	3,000.00	6,000
Sewer system	lump sum		52,500
Heating & ventilating	% bldg. $	10.7%	(510,200)
Steam system			35,500
Air conditioning equip. (300 T. well, 300 T. mech.)	600 ton	74.50	(448,500)
Central air cond. (2 unit, 150 T. ea.)	300 ton	538.33	161,500
Duct work, including grilles	160,000 lb	0.94	150,000
Unit air conditioners, incl. controls	160 ea	856.25	137,000
Refrig. equip. & mach. (17 T. Cap.)	lump sum		26,200
Electrical wiring & fixtures	% bldg. $	6.8%	(324,401)
Electric wiring—power & light	3,500 lf	1.71	5,985
Power switchboards	2 ea	20,000.00	40,000
Generator sets or other converters	1 ea	3,200.00	3,200
Electrical fixtures	6,406 ea	18.71	(119,868)
Light fixtures	2,686 ea	29.60	79,506
Outlets & switches	3,720 ea	10.85	40,362
Telephone system	lump sum		4,348
Annunciator system (nurses' call)	216 inst	53.24	11,500
Electrical paging or calling sys.	lump sum		14,800
Misc. sys.-fire alarm, clock, radio	lump sum		39,700
Sub-station (500–1800 KW)	lump sum		85,000
Elevators	% bldg. $	3.4%	(164,450)
Passenger elevators (16 stops)	2 ea	35,000.00	70,000
Freight (9 stops)	1 ea	55,000.00	55,000
Dumbwaiters (24 stops)	3 ea	10,150.00	30,450
Casket lift (2 stops)	1 ea	9,000.00	9,000
Equipment (incl. installation)	% bldg. $	5.1%	(243,630)
X-Ray	lump sum		19,764
Oper. exam. & treat. room equip	250 bed	18.00	4,500
Dental equipment	250 bed	15.00	3,730
Laboratory equipment	250 bed	80.00	20,000
Sterilizers	16 ea	1,250.00	20,000
Furniture	250 bed	265.00	66,250
Kitchen & bakery equipment	250 bed	270.00	67,500
Other equipment	lump sum		41,866
Garage	91,200 cf	0.58	53,000
Apartment House (A)	29,200 cf	1.64	48,000
Apartment House (B)	29,200 cf	1.64	48,000
Manager's Quarters	30,654 cf	1.70	52,000
Nurses' Quarters	55,900 cf	1.40	78,000
Attendants' Barracks	31,000 cf	1.45	45,000
Boiler House	90,130 cf	2.88	(260,000)
Foundation & substructure	% bldg. $	3.8%	9,917
Building enclosure	% bldg. $	22.4%	58,082
Interior finish	% bldg. $	1.1%	2,914
Plumbing, piping & fixtures	% bldg. $	4.6%	12,005
Heating & ventilating	% bldg. $	62.9%	(163,500)
Steam system	lump sum		(163,500)
Piping	lump sum		19,000
Pipe covering	lump sum		6,400
Boilers & access. (165.4 H. P. ea.)	3 ea	46,000.00	138,000
Electrical wiring & fixtures	% bldg. $	5.2%	13,582
Total Construction Cost	% constr. $	100%	$5,725,100
Materials & Equipment Furnished	% constr. $	1.4%	80,000
Mat. & Equip. Furn. Contr., Charged to Project Funds, Distr. to Features—Cr.	lump sum		(−80,000)
X-ray equipment (contr. acct. 401.91)	lump sum		−18,739
Dental equipment (contr. acct. 401.93)	lump sum		−3,000
Kitchen & bakery (contr. acct. 401.97)	lump sum		−25,000
Other equip. (laundry) (contr. Acct. 401.98)	lump sum		−33,261
OVERHEAD, ENG'R. & INSPECTION	% constr. $	8.9%	(512,078)
ARCHITECT-ENGINEER CONTRACTS	% constr. $	3.3%	(190,922)
A-E- Title I work	% constr. $	3.2%	185,197
A-E title II work	% constr. $	0.1%	5,725
PRELIMINARY ENGINEERING	% constr. $	1.0%	56,740
GENERAL ENGINEERING	% constr. $	0.1%	5,725
INSPECTION & SUPERVISION	% constr. $	1.0%	56,638
SURVEYS—CONSTRUCTION	% constr. $	0.1%	7,425
FIELD OVERHEAD	% constr. $	0.1%	5,700
DISTRICT & DIVISION OVERHEAD	% constr. $	3.3%	188,928
CONTINGENCIES RESERVE	% constr. $	3.7%	(214,530)
Construction	lump sum		204,900
Supervision & engineering	lump sum		9,630
Total Project Cost	**250 bed**	**$25,806**	**$6,451,708**
Total Unit Cost	**2,993,678 cf**	**$2.15**	


Holmes 12-foot
sheave wheel
and SKF Pillow Blocks
. . . teamed for
efficient operation



A sheave wheel takes a lot of punishment, and mine operation depends on its smooth-running efficiency. That's why Robert Holmes & Bros. specified SKF SDAF Pillow Blocks . . . on the five 12-foot diameter, bicycle type, sheave wheel assemblies furnished for Peabody Coal Company's new mine at Pana, Illinois.

Here are features of SKF Pillow Blocks . . . widely used in mines, mills and factories. Check this list:

- **Rugged — stands up under heavy usage**
- **Easy to Install and Service — a few simple steps**
- **Minimum Maintenance — equipped with SKF's exclusive Triple-Seal rings to keep lubricant *in* . . . dust and water *out*!**
- **Versatile — there's a pillow block for every job!**

Complete engineering service is available. Write us.
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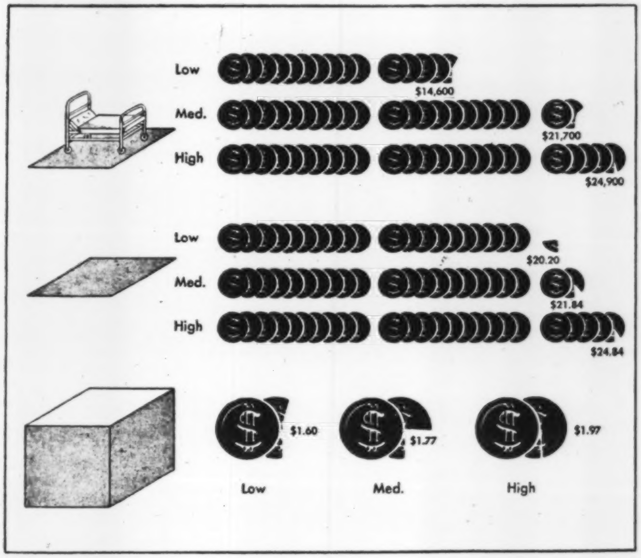
PILLOW BLOCKS ENGINEERED BY SKF



Unit Costs of Veterans Hospitals

Costs of 29 Veterans Administration general medical hospitals, put under contract from September, 1946 to October, 1948 show a consistency and pattern of great value in refining the use of "per bed," "per sq. ft." or "per cu. ft." costs for quick, rough, preliminary cost estimating.

Each of these three types of unit costs computation is influenced, of course, by individual design, which could not be analyzed in detail for the present study. These design factors would include: Whether long narrow wings or square floor plans are used; whether open wards or enclosed private or semi-private rooms are provided; the ratio of service facilities, visitors reception rooms, Red Cross offices, laboratories, to the space actually occupied by beds.

Cost per bed to build VA hospitals is considerably higher than for civilian hospital construction because of the numerous extra facilities VA must provide. These include main hospital building, laundry building, boiler house, utility maintenance shops, station garage, manager's residence, staff quarters (four-family apartment or two duplex), nurses' quarters, outside services (utility lines, sewage, etc.), ground development (roads, walks, landscaping). The main hospital building includes: Outpatient medical and dental treatment rooms and clinics, laboratories, veteran and service organizations' rooms, administrative space, patients' dining hall large enough to accommodate approximately 60 percent of the patient population, staff dining hall, attendants' dining hall, oversized kitchen that must also provide space for at least 30 days' food supply, an assembly room or auditorium to accommodate from 50 to 60 percent of the patient population, chapel, canteen and recreation rooms. Typical nursing unit 40 beds.

This study shows, that:

1. In general, all unit costs are lower in the larger hospitals and get higher as the number of beds decreases.
2. The spread between high and low unit costs for different hospitals is less in the larger projects and greater where the beds are fewer.
3. The spread between high and low is greatest for the per bed costs and least, for the most part, in cube costs, though exceptions to the latter are marked and numerous.

Normal VA general medical hospital contract costs range from $15,000 per bed to $25,000 (at August, 1947 price levels. Increase by 11 percent to allow for February, 1949 prices). This price span eliminates one very high cost of $39,821 per bed for a 100 bed hospital that had pile foundations included in its costs but not included in other hospital costs. Also eliminated is one very low per bed cost of $14,233, awarded in September 1946, with a low of 694 sq. ft. of gross floor area per bed.

Costs per sq. ft. range from $20.00 to $25.00 (also at Aug. 1947 price levels). Here a high extreme of $26.21 is discarded for the reasons given above. The same hospital that had an extreme low per bed cost showed a sq. ft. cost of $20.20, not an extreme.

Costs per cu. ft. ranged from $1.60 to $1.97 at Aug. 1947 price levels. Here, too, an extreme high of $2.02 has been discarded because pile foundations costs were included and could not be eliminated. An extreme low of $1.41 has also been eliminated. This belongs to the same hospital that

Table I. Hospital Costs Compared by Size Groups

(August, 1947 price level used, ENR Building Cost Index 318. To modify for changes in materials prices and wage rate divide by 318 and multiply by ENR Building Cost Index value (Base 1913=100) for month for which cost values are wanted To adjust to Feb. 1949, for example, divide by 318, multiply by 353)

Size Group		No. of Hospitals in each	Cost per Bed			Sq. Ft. per Bed Highest Cost	Sq. Ft. per Bed Lowest Cost	Cost per Sq. Ft.			Cost per Cu. Ft.		
	No. of Beds	Group	High	Med.	Low	Bed	Bed	High	Med.	Low	High	Med.	Low
A**	910–1005	4	$16,712	$15,664	$14,681	783	735	$21.51	$20.84	$19.93	$1.77	$1.625	$1.60
B	300–500	8	22,486*	19,045	14,233	910	694	24.71*	21.55	20.20	2.02*	1.725	1.41
B#	300–500	6	21,140	19,045	15,490	968	736	23.94	21.50	20.71	1.90	1.725	1.63
C	200–255	13	24,851	22,781	19,262	1,171	1,033	24.84	22.99	20.20	1.94	1.78	1.68
D	100	4	39,821*	23,636	22,429	1,518	1,072	26.21*	28.54	21.42	1.97*	1.815	1.70
D#	100–162	3	24,095	22,778	22,429	972	1,072	24.80	22.29	21.42	1.85	1.78	1.70

* Pile Foundations.

** All four hospitals in A group had separate foundation contracts which have been excluded from these figures.

Excluding 3 hospitals: Miles City, Mont. (Group D) and Wilkes Barre (Group B) (Pile foundation included in both and unit costs at extreme high) also Providence, R. I., first contract let and unit prices at extreme low. (Group B).

Cost data used herewith is amount of contract award, it does not include construction contingencies, change orders, site costs, technical services and centrally procured equipment.

Table II. Spread in Unit Costs Reported—By Size of Hospital

	Beds	No. of Hospitals	Percent High Unit in Cost per bed	Percent High Unit in Cost per sq. ft.	Percent High Unit in Cost per cu. ft.
A	910–1005	4	14%	8%	10%
B	300–500	8	58%	22%	43%
B#	300–500	(6)	(36%)	(19%)	(7%)
C	250–255	13	30%	23%	15%
D	100–146	4	78%	22%	16%
D#	151–162	(3)	(7%)	(15%)	(9%)
All Groups		29	180%	31%	43%
All # Groups		(26)	(70%)	(24%)	(23%)

Discarding 3 extremes, 2 high, 1 low.

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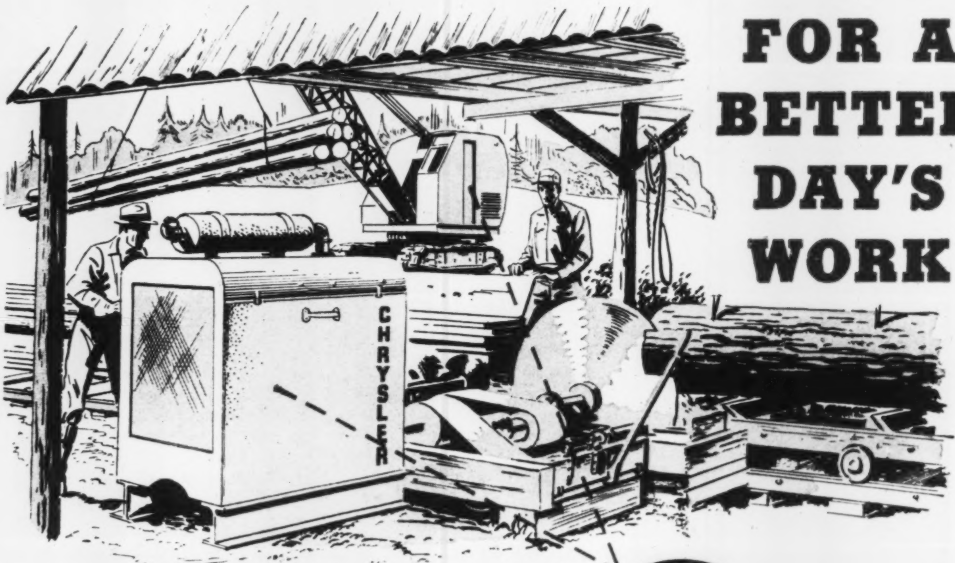

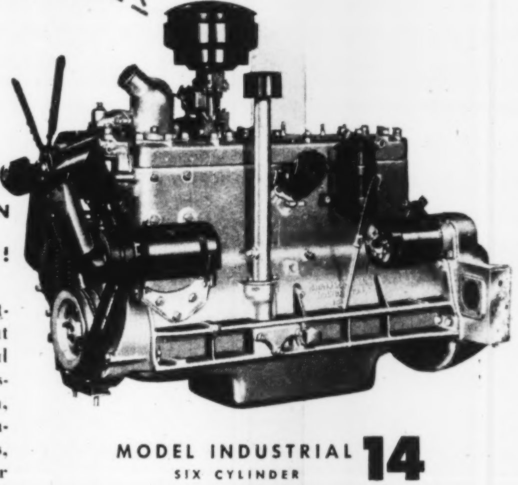

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One hospital—Newark—has, in its own size group (910-1,005 beds), the highest cost per bed and the lowest cost per cu. ft.

In the medium large group (discarding the same extreme low as above) Denver, Colo.—with caisson foundations included in costs—has the lowest cost per bed, (494 beds); Seattle, Wash., (300 beds) has the lowest cost per sq. ft. and Shreveport, La., (452 beds) the lowest cost per cu. ft.

Thus these per bed, per sq. ft. and per cu. ft. costs are seen to be far from precision construction cost estimating tools. They are useful in providing working approximations and testing design and construction performance. Their limits of probable accuracy are defined and refined in the accompanying tables.

Through the combined efforts of the Veterans Administration and the Corps of Engineers, this VA hospital building program really got rolling in August 1947, with the Fort Hamilton, N. Y. and Fresno, Calif. hospital contracts, the former with 981 beds, the latter with 250. (Detailed reports on unit prices used for monthly progress payments to the contractor are available for both Fort Hamilton and Fresno, the former in ENR May 27, 1948, p. 91, the latter in this issue of ENR.) Three contracts preceded these for 399 beds, 162 and 152 beds. The remaining 24 contracts were let in the following 12 months during which there was a 12 percent increase in basic labor and material costs.

To compare unit costs on contracts let during this cost rise, all had to be adjusted to a common price base. So Fort Hamilton and Fresno costs were averaged to establish such a base and the ENR Building Cost Index for the same month was used as the measure of changes in materials prices and construction wage rates. Its value for August, 1947 is 318. Values for other months were divided by this amount to get the factor used for adjusting the unit prices of the other 27 hospitals to the Fort Hamilton-Fresno base.

No geographical pattern of costs can be detected but the general pattern is clear: unit costs come down as the size of hospital increases. The following grouping of cube costs illustrates both these conclusions:

Extreme low cube cost is $1.41 in Rhode Island (Sept. 1946 contract).

Extreme high cube is $2.02 in Pennsylvania (pile foundations incl).

Cu. ft. Costs from $1.60–$1.69
- 3 large hospitals, in N. Y. & N. J.
- 2 medium large, La. & Del.
- 1 medium small, Mo.

Cu. ft. Costs from $1.70–$1.79
- 1 large hospital, in N. Y.
- 2 medium large, Wash. & Calif.
- 6 medium small, Calif., Tex., W. Va., Nebr., Wash., Mich.
- 2 small, N. H. & N. Dak.

Cu. ft. Costs from $1.80–$1.89
- 1 medium large hospital, Nebr.
- 4 medium small, Pa., Ind., Pa., Tex.
- 1 small, Colo.

Cu. ft. Costs from $1.90-$1.97
- 1 medium large hospital, in Ark.
- 2 medium small, Mich. & W. Va.
- 1 small, Mont.

Half of the unit prices contracted for on these hospitals were lower than

Table III. Contract Prices Analyzed for Individual Hospitals

GROUP A 910-1005 Beds (Foundation Contracts Excluded)	No. of Beds	Contr. Date	ENR Cost Index	Cost per Bed: Sq. Ft. per Bed	Cost per Bed: Contr.	Cost per Bed: 8-47 Base	Cost/Sq. Ft. Contr.	Cost/Sq. Ft. 8-47 Base	Cost/Cu. Ft. Contr.	Cost/Cu. Ft. 8-47 Base
Fort Hamilton, N. Y.	981	8/47	100	737	16,313	16.313	21.51	21.51	1.76	177
Buffalo, N. Y.	1,005	12/47	105	727	15,766	15,015	21.60	20.57	1.72	164
Albany, N. Y.	1,005	3/48	105	735	15,415	14,681	20.93	19.93	1.69	161
Newark, N. J.	910	4/48	105	783	17,548	16,712	22.18	21.12	1.68	160
Foundations only										
Fort Hamilton, (Pile)	....	8/47	....	....	$435	....	0.57	....	.05	....
Buffalo, N. Y. (Caisson)	....	12/47	....	....	442	....	0.60	....	.05	....
Albany, N. Y. (Steel H Pile)	....	3/48	....	....	838	....	1.14	....	.09	....
Newark, N. J. (Pile)	....	4/48	....	....	742	....	0.95	....	.07	....

Fort Hamilton: Highest cost per sq. ft., Highest cost per cu. ft.

Newark: Highest cost per bed (783 sq. ft./bed), Lowest cost per cu. ft.

Albany: Lowest cost per bed (735 sq. ft./bed), Lowest cost per sq. ft.

GROUP B 300-500 Beds

Hospital Location	Size Beds	Contr. Date	ENR Cost Index	Cost/Bed Contr.	Cost/Bed 8-47 Base	Cost/Sq. Ft. Contr.	Cost/Sq. Ft. 8-47 Base	Cost/Cu. Ft. Contr.	Cost/Cu. Ft. 8-47 Base
Omaha, Nebr.	500	2/48	105	19,637	18,702	25.14	23.94	1.97	1.88
Little Rock, Ark	500	2/48	105	20,270	19,305	24.81	23.63	2.00	1.90
Denver, Colo.**	494	9/48	112	17,349	15,490	23.65	21.12	1.95	1.74
Wilkes Barre, Pa.*	470	3/48	105	23,610	22,486*	25.95	24.71	2.12	2.02*
Shreveport, La	452	11/47	103	21,560	20,932	21.81	21.17	1.68	1.63
Providence, R. I.	399	9/46	86	12,060	14,233	17.37	20.20	1.21	1.41
Wilmington, Del.*	322	2/48	105	22,197	21,140	22.93	21.84	1.73	1.65
Seattle, Wash	300	10/48	112	21,039	18,785	23.20	20.71	1.92	1.71

* Pile Foundation.
** Caisson Foundation.

Wilkes Barre, Pa. (Pile Foundations Included)	Highest Cost per Bed (910 sq. ft./bed). Highest Cost per sq. ft. Highest Cost per Bed cu. ft.
Providence, R. I. (Awarded Sept., 1946)	Lowest Cost per Bed (694 sq. ft./bed). Lowest Cost per cu. ft.
Denver Colo. (Caisson Foundations)	Next to Lowest Cost per Bed (736 sq. ft./bed).
Seattle, Wash.	Next to Lowest Cost per sq. ft.
Shreveport, La.	Next to Lowest Cost per cu. ft.

GROUP C 200-255 Beds

Hospital Location	Size Beds	Date Contr.	ENR Cost Index	Cost/Bed Contr.	Cost/Bed 8-47 Base	Cost/Sq. Ft. Contr.	Cost/Sq. Ft. 8-47 Base	Cost/Cu. Ft. Contr.	Cost/Cu. Ft. 8-47 Base
Iron Mountain, Mich	255	2/48	105	22,734	21,651	24.38	23.22	2.02	1.92
Fresno, Calif	250	8/47	100	22,580	22,580	21.86	21.86	1.78	1.78
Big Spring, Tex	246	1/48	105	22,938	21,846	22.37	21.30	1.79	1.70
Erie, Pa	208	4/48	105	24,799	23,618	26.08	24.84	1.98	1.89
Beckley, W. Va	203	2/48	105	25,304	24,099	25.08	23.89	2.04	1.94
Clarksburg, W. Va	203	3/48	105	25,144	23,946	24.14	22.99	1.85	1.76
Grand Island, Nebr	201	12/47	105	26,094	24,851	22.28	21.22	1.80	1.71
Poplar Bluff, Mo.	201	12/47	105	25,271	24,068	21.39	20.37	1.77	1.68
Fort Wayne, Ind	200	2/48	105	23,920	22,781	25.21	24.01	1.98	1.89
Altoona, Pa	200	3/48	105	25,920	24,686	25.17	23.97	1.97	1.88
Spokane, Wash	200	3/48	105	20,225	19,262	21.21	20.20	1.81	1.72
Saginaw, Mich	200	4/48	105	22,589	21,513	22.93	21.84	1.81	1.72
Marlin, Tex	200	6/48	106.6	23,649	22,101	24.74	23.12	2.09	1.88

Grand Island, Nebr.	Highest Cost per Bed (1171 sq. ft./bed).
Erie, Pa.	Highest Cost per sq. ft.
Beckley, W. Va.	Highest Cost per cu. ft.
Spokane, Wash.	Lowest Cost per Bed (954 sq. ft./bed).
Spokane, Wash.	Lowest Cost per sq. ft.
Poplar Bluff, Mo.	Lowest Cost per cu. ft.

GROUP D 100-162 Beds

Hospital Location	Size Beds	Date Contr.	ENR Cost Index	Contr.	8-47 Base	Contr.	8-47 Base	Contr.	8-47 Base
Minot, N. Dak	162	6/47	97	21,765	22,429	21.62	22.29	1.65	1.70
Grand Junction, Colo.*	152	1/47	93	22,408	24,095	23.06	24.80	1.72	1.85
Manchester, N. H	151	6/48	106.6	24,281	22,778	22.83	21.42	1.90	1.78
Miles City, Mont.*	100	9/48	112	44,599	39,821*	29.35	26.21	2.21	1.97

* Pile Foundation.

JOB DATA

Engineers: Black & Decker engineering staff.
Contractor: Warren-Ehret Co., Baltimore, Md.
Type of deck: Precast gypsum.
Type of roof: 4-ply pitch and slag.
Insulation: Fiberglas, 13/16" thick.
Area: 572 squares.
Slope: 1/8" per foot.

BLACK and DECKER had 5 Good Reasons for Choosing FIBERGLAS* Roof Insulation

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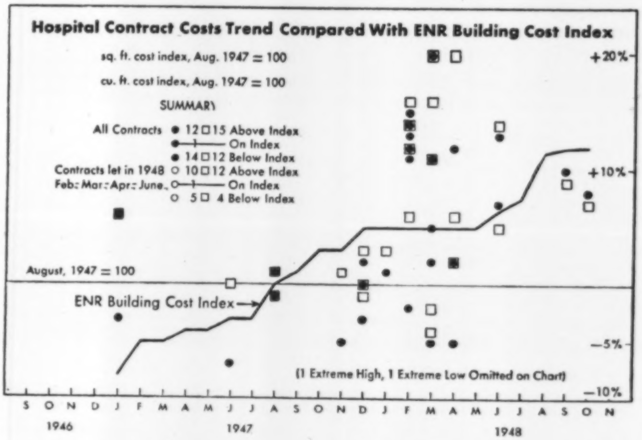
the cost index measuring the rise in materials prices and wage rates. The majority of these were awarded in November, December, 1947, and January, September and October, 1948.

The other half, which were higher than the basic cost rise, were awarded in February, March, April and June, concentrated bidding and contracting months. While this was a period of stable costs, the third round of wage increases was about to start. Also the basing point pricing of cement and steel had been upset and threatened price increases that subsequently developed. Most of these top half prices are in line with the material costs and wage rates that developed as construction was getting underway. This would indicate that the VA hospital program has attracted close bidding by contractors.


Hospital Contract Costs Trend Compared With ENR Building Cost Index

Analysis of Veterans Administration General Medical and Surgical Hospitals Design and Constructed under Supervision of Corps of Engineers—Except as noted

PROVIDENCE, R. I. (9/46) Main Building, Basement and 9 stories, 232,954 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Building, 44,044 sq.ft., similar in design and construction. 399 beds. $4,812,013 (VA design).

GRAND JUNCTION, COLO. (1/47) Main Building, Basement and 6 stories, 107,820 sq.ft. Reinforced Concrete Construcon Pile Foundation—Monolithic concrete walls and trim. Auxiliary Buildings, 39,860 sq.ft., similar in design and construction. 152 beds. $3,406,000 (CA design).

MINOT, N. DAK. (6/47) Main Building, Basement and 7 stories, 132, 437 sq.ft. Reinforced Concrete Construction—Monolithic concrete walls and trim. Auxiliary Buildings, 30,732 sq.ft., similar in design and construction. 162 beds. $3,525,945 (VA design).

FRESNO, CALIF. (8/47) Main Building. Sub-Basement, Basement and 7 stories, 225,020 sq.ft. Structural Steel frame fireproofed—Monolithic concrete walls faced with Terra Cotta. Auxiliary Buildings, 33,172 sq.ft., similar in design and construction except faced with cement plaster. Power House faced with ceramic veneer. 250 beds. $5,645,100.

FT. HAMILTON (BROOKLYN), N. Y. (8/47) Main Building, Basement, Ground Floor and 19 stories, 690,324 sq.ft. Steel frame fireproofed on Pile Foundation—Stone faced and trim. Auxiliary Buildings, 53,899 sq.ft., similar in design and construction, including pile foundation. 981 beds. $16,429,840.

SHREVEPORT, LA. (11/47) Main Building, Sub-Basement, Basement, 10 stories and Pent House, 404,160 sq.ft. Reinforced concrete frame—Brick faced—Stone trim. Auxiliary Buildings, 22,629 sq. ft., similar in design and construction. 452 beds. $9,745,099.

BUFFALO, N. Y. (12/47) Main Building, Sub-Basement, Basement and 14 stories, 686,314 sq.ft. Structural steel frame fireproofed on Caisson foundation—Limestone and gray soapstone faced and trim. Auxiliary Buildings, 47,412 sq.ft., similar in design and construction. 1,005 beds. $16,289,035.

GRAND ISLAND, NEBR. (12/47) Main Building, Basement and 7 stories, 194,456 sq.ft. Reinforced concrete construction—Brick faced—Stone trim. Auxiliary Buildings, 40,909 sq.ft., similar in design and construction. 201 beds. $5,244,854.

POPLAR BLUFF, MO. (12/47) Main Building, Basement and 7 stories, 196,919 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 40,472 sq. ft., similar in design and construction. 201 beds. $5,079,500.

BIG SPRING, TEX. (1/48) Main Building, Basement and 6 stories, 204,044 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 48,289 sq.ft., similar in design and construction. 246 beds. $5,642,654.

OMAHA, NEBR. (2/48) Main Building, Basement and 11 stories, 360,550 sq.ft. Steel framing fireproofed—Brick faced—Slate sills—Stone trim. Auxiliary Buildings, 29,953 sq. ft., similar in design and construction. 500 beds. $9,818,400.

IRON MOUNTAIN, MICH. (2/48) Main Building, Basement and 6 stories, 209,035 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 39,247 sq.ft., similar in design and construction. 255 beds. $6,052,221.

FORT WAYNE, IND. (2/48) Main Building, Basement and 5 stories, 177,928 sq.ft. Reinforced Concrete Construction—Lower floors stone faced—Upper floors brick faced—stone trim. Auxiliary Buildings, 11,824 sq.ft., similar in design and construction. 200 beds. $4,784,039.

LITTLE ROCK, ARK. (2/48) Main Building, Basement, Ground Floor and 10 stories, 378,228 sq.ft. Reinforced Concrete Construction—Lower floors granite and stone faced—Upper floors brick faced—Stone trim with Terra Cotta panels. Auxiliary Buildings, 30,249 sq.ft., similar in construction—Brick faced—Field stone trim. 500 beds. $10,135,216.

BECKLEY, W. VA. (2/48) Main Building, Basement and 6 stories, 193,278 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 11,552 sq.ft., similar in design and construction. 203 beds. $5,136,646.

WILMINGTON, DEL. (2/48) Main Building, Ground Floor and 8 stories, 271,533 sq.ft. Reinforced Concrete Construction on pile foundation—First floor portion stone faced—remainder brick faced. Auxiliary Buildings, 40,187 sq.ft., similar in design and construction. 322 beds. $7,147,375.

ALTOONA, PA. (3/48) Main Building, Sub-Basement, Basement and 7 stories, 182,153 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 23,845 sq.ft., similar in design and construction. $5,183,995.

WILKES-BARRE, PA. (3/48) Main Building, Basement and 11 stories, 387,869 sq.ft. Reinforced concrete Construction on pile foundation—Brick faced—Green stone sills—Stone copings. Auxiliary Buildings, 39,823 sq.ft., similar in design and construction. 470 beds. $11,097,060.

CLARKSBURG, W. VA. (3/48) Main Building, Basement and 6 stories, 190,846 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 20,602 sq.ft., similar in design and construction. 203 beds. $5,104,197.

ALBANY, N. Y. (3/48) Main Building, Basement and 15 stories, 739,950 sq.ft. Steel Construction fireproof on steel piling—Brick faced—Stone trim. 1,005 beds. $16,334,726.

SPOKANE, WASH. (3/48) Main Building, Basement and 8 stories, 157,241 sq.ft. Reinforced Concrete Construction—Monolithic Concrete Walls—Metal trim. Auxiliary Buildings, 33,497 sq.ft., similar in design with Brick Veneer on wood frame. 200 beds. $4,044,988.

NEWARK, N. J. (4/48) Main Building, Basement and 13 stories, 659,395 sq.ft. Reinforced Concrete Construction—Brick and stone faced—Stone trim. Auxiliary Buildings, 53,050 sq.ft., similar in design and construction. 910 beds. $16,479,533.

ERIE, PA. (4/48) Main Building, Basement and 8 stories, 181,624 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. Auxiliary Buildings, 16,156 sq.ft., similar in design and construction. 208 beds. $5,158,233.

MANCHESTER, N. H. (6/48) Main Building, Basement and 6 stories, 160,618 sq.ft. Reinforced Concrete Construction—Brick faced—Stone trim. 151 beds. $3,666,430.

MILES CITY, Mont. (9/48) Main Building, 4 stories, 108,799 sq.ft. Reinforced Concrete Construction on pile foundation—Brick faced—Stone trim. Auxiliary Buildings, 42,993 sq.ft., similar in design and construction. 100 beds. $4,459,922.

SEATTLE, WASH. (10/48) Main Building Sub-Basement, Basement and 8 stories, 252,319 sq.ft. Reinforced Concrete Construction ("Seismic Type")—Part Stone faced—Part Ceramic Veneer. Auxiliary Buildings, 19,429 sq.ft., masonry veneer—Conventional design and construction. 300 beds. $6,311,650.

SAGINAW, MICH. (4/48) Main Building, Basement and 5 stories, 172,585 sq.ft. Reinforced Concrete Construtcion — Brick crete Pile Foundation—Brick faced—Stone trim. Auxiliary Buildings, 25,153 sq.ft., similar in design and construction. 200 beds. $4,517,767. (VA design and construction supervision).

MARLIN, TEXAS (6/48) Main Building, Basement and 5 stories, 172,595 sq.ft. Reinforced Concrete Construction — Brick faced—Stone trim. Auxiliary Buildings, 19,616 sq.ft., similar in design and construction. 200 Beds. $4,729,727. (VA design and construction supervision).

DENVER, COLO. (9/48) Main Building, Sub-Basement, Basement and 10 stories, 342,717 sq.ft. Structural Steel frame on Caissons foundation—Brick faced—Stone trim. Auxiliary Buildings, 19,624 sq.ft., similar in design and construction. 494 beds. $8,570,384. (VA design and construction supervision).

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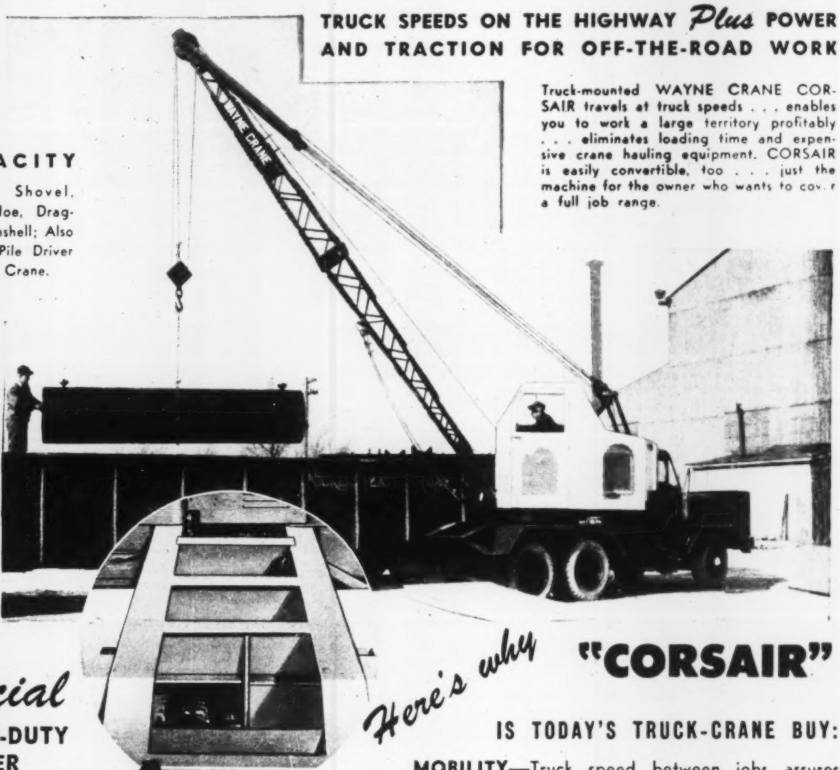

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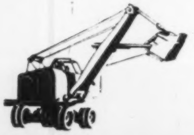

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Postwar Price Experience on Dams

Corps of Engineers studies prices paid contractors in relation to ENR Construction Cost Index

To sharpen up its construction cost estimating pencils the Corps of Engineers has developed construction price indexes based on bids by contractors on its own civil works projects.

These indexes are of two types, the first showing variations in unit price according to quantities involved, cu. yds. of concrete or excavation or lbs. of steel for example, and the second a weighted composite of elements representing more than 70 percent of the total cost of the work.

A multiple attack on cost estimating has resulted from this study, carried on in the Project Planning Branch, Engineering Division of Civil Works, Office, Chief of Engineers, under direct supervision of G. A. Wallace, Chief of the Branch, and general supervision of R. W. Stuck, Chief of the Division.

Contractors' bids show what prices have been paid for construction in the past. Engineers' estimates have to predict what prices will have to be paid in the future. Thus unit bid price are not enough: a cost trend index is needed as a guide in the projection of past experience to current conditions and future outlook.

Used in preparing projects for bids and selecting the successful bidder, cost estimates are required for budget purposes; as a basis for determining the economic justification of proposed future projects currently under investigation in reports directed by Congress, and for revising estimates of cost of works recommended in previous years in reports to the Congress.

These new price indexes, reported here, represent the average for the country as a whole. Since individual prices for some items deviate rather widely from the average it was found necessary to use six-month periods as a basis for computing values.

The first index, showing the effect of quantity on price is illustrated by an example in which mass concrete was used. The range in cost of mass concrete for gravity concrete dams is shown in Fig. 1. Average cost lines were determined by plotting low bidder unit price for this item against volume of concrete on all dam projects for the years indicated.

In all, 12 such charts have been prepared, covering these major construction items: Common excavation; rock excavation; embankment (including borrow and compaction); reinforcing steel; structural steel; sheet steel piling; and six classes of concrete. It was found impracticable to use shorter periods of time than six months due to insufficient data to indicate clearly a cost change. In some cases it has been necessary to use a yearly basis, as in the case of mass concrete.

Due to the moratorium on construction during the last half of 1946 there is no cost data for that period. Since one of the purposes of this study was to determine the increase in cost of construction items following the relatively stable prewar period, low bid prices for work advertised from 1939 through 1941 were worked up as the base unit price and plotted as a single price line on each graph. This price line represents the average bid price for the quantity for the country as a whole. For many of the charts there is considerable deviation from this average. However, in most cases the grouping of points is such that a line originally drawn by eye was later found to be substantially correct when computed by least squares.

Cost indexes for a concrete dam and also an earth dam are compared in Fig. 2, with the ENR construction cost index for the same period using 1940 (ENR 241.96) as a base of 100.

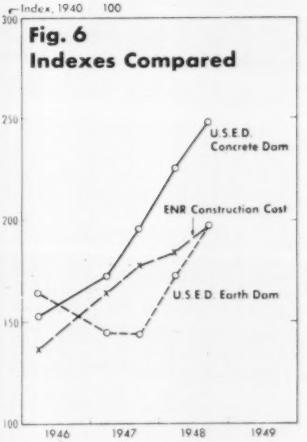


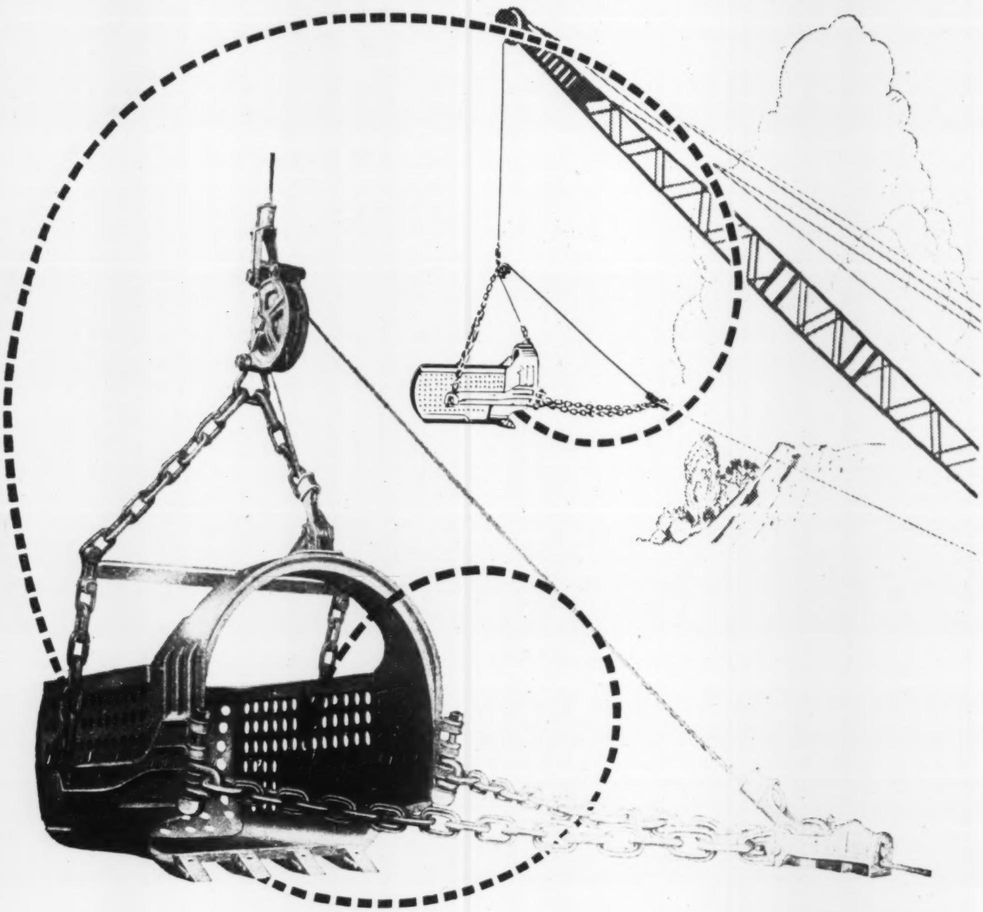
Fig. 6
Indexes Compared

TABLE 1, CONCRETE DAM INDEX—1940=100

Item	Quantity	1940 Unit Price	1940 Cost	Jan.-June 1946 Cost	Index	Jan.-June 1947 Cost	Index	July-Dec. 1947 Cost	Index	Jan.-June 1948 Cost	Index	July-Dec. 1948 Unit Price	July-Dec. 1948 Cost	Index
Common Excavation	160,000 c.y.	.315	$50,400	$73,600	146	66,080	131	59,360	118	93,600	186	.695	111,200	222
Rock Excavation	180,000 c.y.	1.50	270,000	369,600	137	448,200	166	513,000	190	594,000	220	3.16	568,800	211
Embankment	170,000 c.y.	.43	73,100	124,100	170	91,290	125	82,790	113	103,190	142	.66	112,200	154
Concrete Mass—Class VI	500,000 c.y.	5.40	2,700,000	4,300,000	159	4,775,000	177	5,500,000	204	6,600,000	244	14.30	7,150,000	265
Concrete—Class IV	47,000 c.y.	7.20	338,400	601,600	178	723,800	214	784,900	232	846,000	250	22.20	1,043,400	309
Concrete—Class II	13,000 c.y.	9.00	117,000	163,800	140	236,600	202	263,250	225	288,600	247	33.80	439,400	375
Reinforcing Steel	3,000,000 lbs.	.043	129,000	234,000	182	255,000	198	285,000	221	327,000	254	.125	375,000	291
Structural Steel	2,000,000 lbs.	.09	180,000	336,000	187	516,000	287	580,000	322	540,000	300	.244	488,000	272
Cement	560,000 bbls.	1.98	1,108,000	1,377,600	124	1,472,800	133	1,663,200	150	1,848,000	166	3.72	2,083,200	188
Total Cost			$4,967,000	$7,580,000	152	$8,585,000	173	$9,732,000	196	$11,240,000	226	......	$12,371,000	249
Engineering News-Record Construction Cost			100	....	137	....	164	....	178	....	184	......		197

TABLE 2, EARTH DAM INDEX—1940=100

Item	Quantity	1940 Unit Price	1940 Cost	Jan.-June 1946 Cost	Index	Jan.-June 1947 Cost	Index	July-Dec. 1947 Cost	Index	Jan.-June 1948 Cost	Index	July-Dec. 1948 Unit Price	July-Dec. 1948 Cost	Index
Common Excavation	650,000 c.y.	.28	$182,000	$266,500	147	$240,500	135	$215,800	118	$341,250	188	.625	$406,250	223
Rock Excavation	66,000 c.y.	1.56	102,960	141,240	137	172,260	167	195,360	190	227,700	221	3.31	218,460	212
Embankment	3,300,000 c.y.	.332	1,095,600	1,881,000	172	1,369,500	125	1,260,600	115	1,551,000	142	.515	1,699,500	155
Concrete—Class IV	20,800 c.y.	8.45	175,760	308,880	176	369,200	210	398,320	227	428,480	244	25.30	526,240	300
Concrete—Class II	7,200 c.y.	11.40	82,080	112,320	137	158,400	193	177,840	216	192,960	224	40.00	288,000	350
Reinforcing Steel	1,800,000 lbs.	.044	79,200	142,200	180	154,800	195	174,600	218	199,800	252	.128	230,400	291
Structural Steel	230,000 lbs.	.10	23,000	43,240	188	65,780	286	74,060	321	68,540	299	.286	65,780	286
Cement	37,200 bbls.	2.43	90,400	112,350	123	123,880	137	135,400	150	149,900	166	4.54	168,900	187
Total Cost			$1,831,000	$3,008,000	164	$2,654,000	145	$2,632,000	144	$3,160,000	173	......	$3,604,000	197
Engineering News-Record Construction Cost				....	137	....	164	....	178	....	184	......		197



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The components of this index as to quantities is shown in Table 1 and 2. These quantities represent the average quantity of 16 concrete dams reflecting 74.6% of their total construction costs and 29 earth dams reflecting 70.2% of their total construction costs. Unit prices used are the prices for the various years applicable to the index quantity as obtained from the price curves discussed in the previous paragraph. Where yearly price lines were shown on the unit price graphs, the half year price is obtained by interpolation. Thus a basis is established for projecting the government estimate with greater refinement and in line with current cost trends.

Comparing estimates with bids

In using the government estimate for comparison with the bids of prospective contractors as a basis of award, the Corps of Engineers reviews this estimate for major jobs prior to bid openings. In addition it makes a continuing study of the relation between the government estimate and the low bid for all work for which bids in excess of $100,000 have been received. Results of this study follow.

Bidding experience for Civil Works construction in the years 1947 and 1948, where the low bid was in excess of $100,000, shows that 3,815 bidders responded to 815 invitations with low bids totaling $781,000,000. The average low bid was 4.5% over the government estimate (computed without profit). The last 6 months the 3.22% margin between low bids and government estimate of cost is the lowest of the 4 periods. (Table 3) Bid margins in October, November and December 1948 of 2.4, 2.0 and 1.2 percent, respectively, average 1.80 percent for the last quarter of 1948, and illustrate recent favorable bidding. This continued and consistent drop in differential between the low bid and the government estimate may be interpreted as a possible reduction in cost to the government through a reduction in the amount of contingent cost for labor and materials which contractors have, in the immediate past, been adding to their computed cost to arrive at their bid price.

Continuing interest and ability of the construction industry to accept additional work is indicated by the number of bids received per invitation, which continues essentially along the mean of 4.68 for the entire period. (Table 3)

As Civil construction resumed in

Figures in vertical column at left show dollars per cubic yard; figures at bottom of charts show volume in cubic yards. →

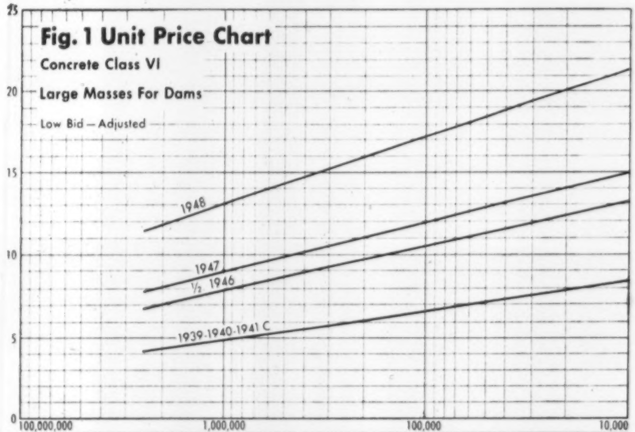

Fig. 1 Unit Price Chart

Concrete Class VI

Large Masses For Dams

Low Bid — Adjusted

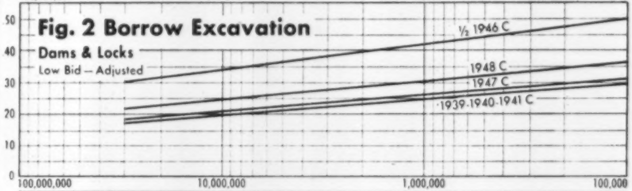

Fig. 2 Borrow Excavation

Dams & Locks

Low Bid — Adjusted

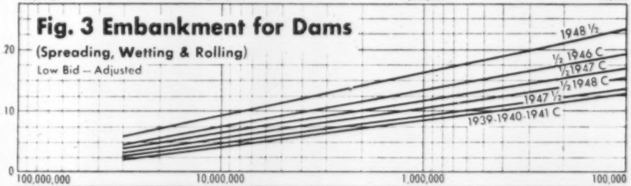

Fig. 3 Embankment for Dams

(Spreading, Wetting & Rolling)

Low Bid — Adjusted

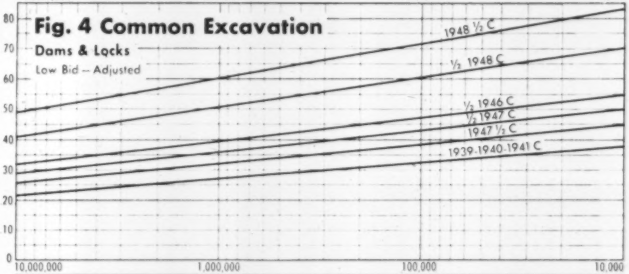

Fig. 4 Common Excavation

Dams & Locks

Low Bid — Adjusted

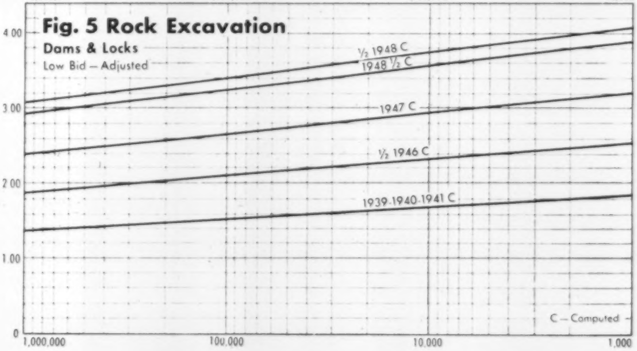

Fig. 5 Rock Excavation

Dams & Locks

Low Bid — Adjusted

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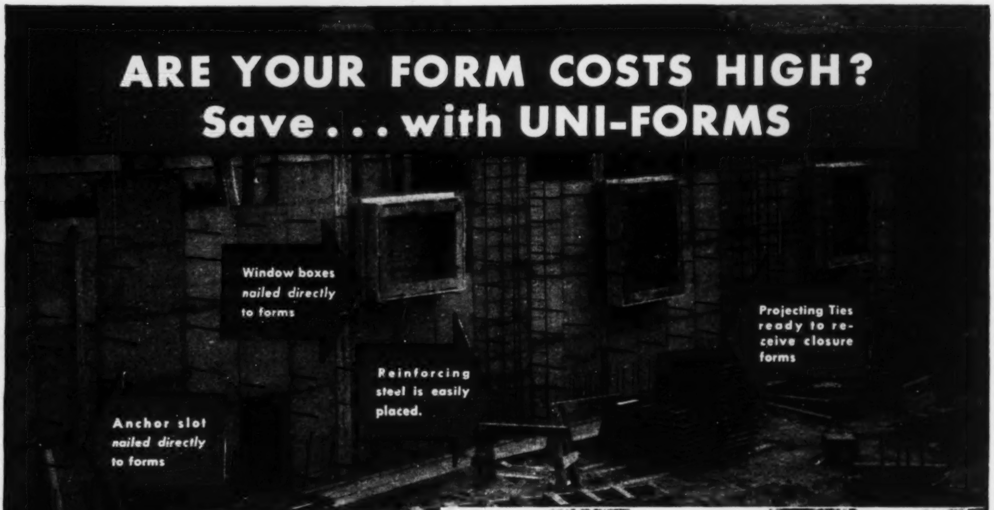
Window boxes nailed directly to forms
Projecting Ties ready to receive closure forms
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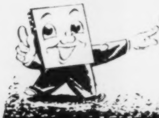

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1946, fear of postwar instability had its immediate effect on bidding, particularly for the longer term contracts. The spread between the government estimate of cost and the low bids submitted by contractors increased as the completion period for the work increases. This differential rises for 3.4% for work of 1 year or less to 36.8% for work extending beyond a 4-year period. (Table 3) It became immediately apparent that, to avoid the contingency which prudent contractors felt constrained to add to cover possible rise in costs for the longer-term contracts, work must be subdivided into short term, one type operation in so far as possible.

TABLE 3, SUMMARY OF 1947-1948 BIDDING EXPERIENCE CIVIL WORKS CONSTRUCTION BIDS OVER $100,000

	Total Amount of Low Bids	Average Amount of Low Bid	Average % Above Govt. Est.*	Number of Invitations	Total Bids Received	Ave. No. of Bids per Invitation
By 6 Month Period						
Jan.-June '47	$196,144,000	$948,000	3.25%	207	1,032	4.99
July-Dec. '47	131,928,000	631,000	5.52	209	878	4.20
Jan.-June '48	205,896,000	1,163,000	6.51	177	905	5.11
July-Dec. '48	247,077,000	1,112,000	3.22	222	1,000	4.51
Jan. '47 thru Dec. '48	$781,045,000	$958,000	4.53%	815	3,815	4.68
By length of contract						
Less than 1 year	$218,770,000	$353,000	3.40%	621	2,818	4.54
1 to 2 years	193,832,000	1,240,000	6.75	156	839	5.38
2 to 3 years	118,000,000	4,720,000	9.38	25	109	4.36
3 to 4 years	104,607,000	13,080,000	13.44	8	35	4.38
4 years or more	145,836,000	29,170,000	36.76	5	14	2.80
Total for all bids	781,045,000	$958,000	4.53%	815	3,815	4.68

*Computed without profit

This subdivision of work wherever physically possible into embankment, tunnel, concrete, etc., contracts, each of short duration, has been quite successful. Response of the contractors to the shorter term type of contract is evident from the percent differential and number of bids received per invitation shown in Table 3. The two-year contract appears to be the most popular having elicited 5.4% bids per invitation as compared to the general average of 4.7. Longer projects, involving greater and longer commitments, restrict the field of bidders and the number of bids drop rapidly as period and volume of work increase.

Another postwar experience in connection with Civil Works construction has been the expansion of the practice of a number of contractors combining and submitting a bid as a joint venture. It is realized that there are several good and valid reasons for this practice on large contracts. However, there have been a number of cases where as many as from six to eight contractors have combined in a joint venture on contracts which it is believed any one of them were capable of undertaking individually. It is rather obvious that a joint venture limits competition by concentrating eight prospective bidders into one bid. It is also probable that this practice results in higher bid prices, as the bid price finally agreed upon by the partners in the venture tends to be at least equal to or greater than the independent individual estimates of half of the members. It is the hope of the Corps of Engineers that the growing tendency of large and substantial firms to participate in such joint bidding ventures on jobs which each of them individually is in a position to undertake, will not become a permanent part of the post war contracting business.

Unit Prices, New York City Housing

New York City Housing Authority contracts for 14 new low-rent projects let since May, 1948 average $1.06 per cu ft. Foundations and superstructure account for 80 cents of each average contract dollar. Cubic foot costs for mechanical trades in the 172 apartment houses covered in this study, average 8.7 cents for heating, 3.6 cents for electricity, and 9.7 cents for the plumbing facilities. Elevator and piling costs are also included in the total contract, piling as a part of the foundations, elevators as separate contracts. These are a continuation of the series of unit costs published in ENR May 27, 1948 for Housing Authority projects let in 1946-'47.

CONTRACT TOTALS AND UNIT PRICES ON PUBLIC HOUSING

1948-49 awards by N. Y. City Housing Authority

Project Number	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Project	**Woodside**	**Eastchester**	**Gov. Smith***	**Albany**	**South Beach**	**Sheepshead Bay**	**Dyckman**
Total Constr. Rooms	5.640	3.810	4.716	3.384	1.717	4,392	4,468
Total Apartments	1.357	874	1.140	829	422	1.056	1,167
Rooms per Apartment, Average	4.16	4.36	4.14	4.08	4.07	4.16	3.83
Total Cu. Ft	11,064,902	7,965,220	9,302,922	7,082,630	3,921,651	9,769,733	10,119,918
Award Date	5/26/48	9/23/48	10/4/48	10/25/48	11/1/48	11/15/48	11/26/48†
Total Cost	11,761,568	8,585,299		7,896,564	4,888,853	10,786,919	.....
Total Contract Cost	**10,812,409**	**8,003,291**	**10,864,881**	**7,224,296**	**4,481,120**	**10,515,737**	**10,033,210**
Cost Per Constr. Room	1,917	2,101	2,304	2,135	2,610	2,394	2,246
Cost Per Apartment	7,968	9,157	9,531	8,714	10,619	9,958	8,597
Cost Per Cu. Ft	.977	1.004	1.167	1.02	1.14	1.076	.991
Foundations and Superstructures	**7,843,784**	**6,142,000**	**8,518,750**	**5,562,000**	**3,390,700**	**8,080,000**	**7,706,300**
Cost Per Constr. Room	1,390.74	1,612.07	1,806.35	1,643.61	1,974.78	1,839.71	1,724.78
Cost Per Apartment	5,780.24	7,027.46	7,472.59	6,709.29	8,034.83	7,651.51	6,603.51
Cost Per Cu. Ft	.709	.771	.916	.785	.864	.827	.761
Heating	**978,000**	**675,401**	**746,626**	**513,777**	**394,660**	**770,777**	**814,000**
Cost Per Constr. Room	173.40	177.27	158.32	151.82	229.85	175.50	182.18
Cost Per Apartment	720.71	772.77	654.93	619.75	935.21	729.90	697.51
Cost Per Cu. Ft	.088	.085	.080	.073	.1006	.079	.080
Electricity	**399,470**	**283,900**	**376,000**	**273,000**	**178,300**	**346,470**	**329,000**
Cost. Per Constr. Room	70.83	74.51	79.73	80.67	103.84	78.87	73.63
Cost Per Apartment	294.38	324.83	329.82	329.31	422.51	328.10	281.92
Cost Per Cu. Ft	.036	.036	.040	.038	.045	.035	.033
Plumbing	**1,134,700**	**715,865**	**998,900**	**721,419**	**376,444**	**949,494**	**889,000**
Cost Per Constr. Room	201.19	187.89	211.81	213.18	219.24	216.18	198.98
Cost Per Apartment	836.18	819.07	876.23	870.22	892.05	899.14	761.78
Cost Per Cu. Ft	.103	.089	.107	.102	.095	.097	.088
Elevators	**456,455**	**186,125**	**224,605**	**154,100**	**141,016**	**368,996**	**294,910**

* 7 of 12 proposed buildings—Gov. Smith. † Foundation contract date only. Cu. ft. quantities used are preliminary—subject to minor revision.

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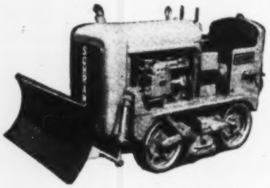
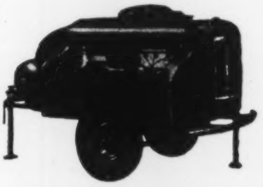
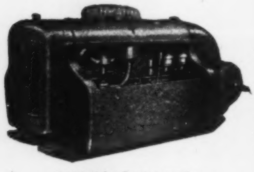
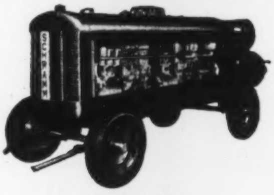
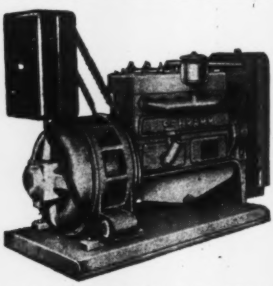

Self-Propelled with Hydraulic Backfill Blade


Two-Wheel Trailer Mounting with Tool Boxes

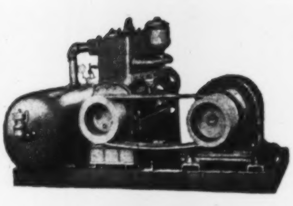

Skidded for Truck Mounting

Truck Mounted

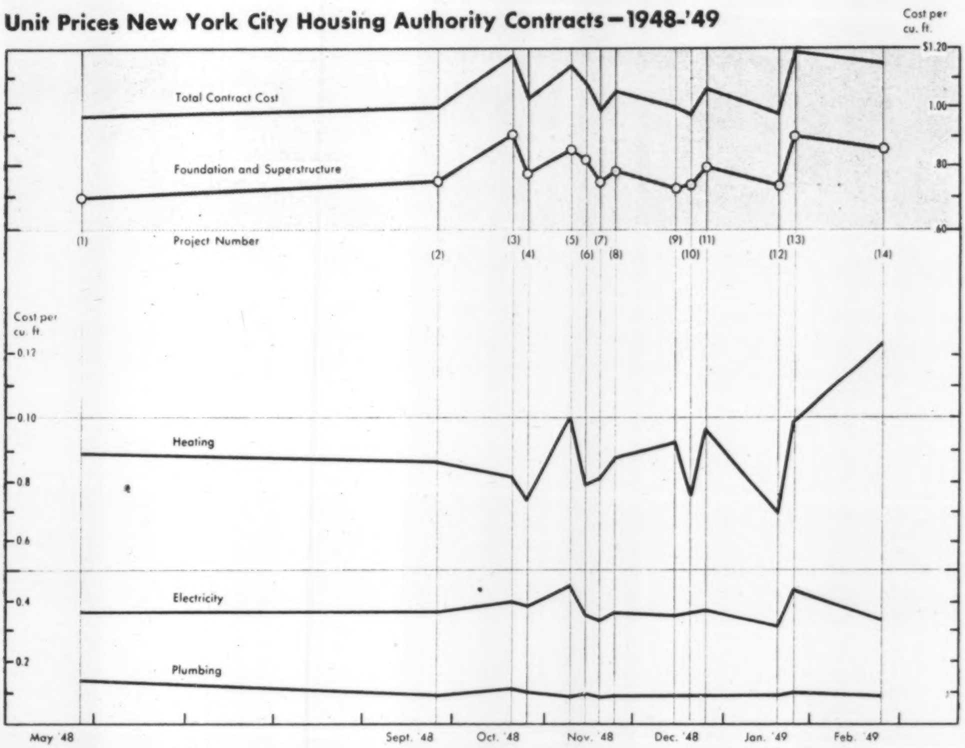

Diesel Engine Drive


Built-in Motor Drive with Cooling Unit and Starter

"V" Belt on Flat Pulley Drive


"V" Belt Drive with Air Receiver

Unit Prices New York City Housing Authority Contracts—1948-'49



The high cu. ft. contract cost is at the Todt Hill project, $1.19, let in January, 1949. This is 21 percent higher than the contract cost of the Lester W. Patterson project for which contracts were let in the same month. The low contract cost per cu. ft. during these 10 months is for the Woodside project, let in May 1948, at 97.7 cents per cubic foot.

From May, '48 to January '49 construction materials prices and wage rates as measured by the ENR building Cost Index went up 6 percent.

The high cu. ft. foundation and superstructure contract unit price is at the Governor Smith houses, let in October of 1948, 91.6 cents.

Nostrand, put under contract in February 1949, has the highest cu. ft. heating and ventilating price, 12.3 cents.

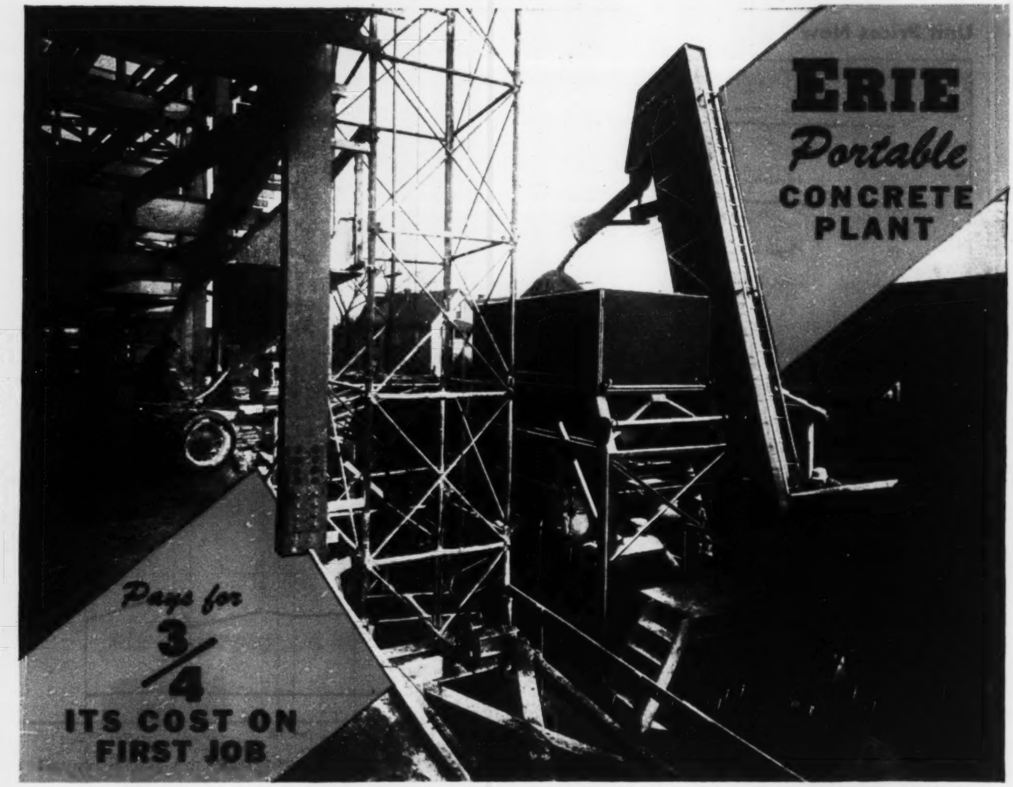
For electrical contract prices, South Beach is high at 4.5 cents per cu. ft. Reported plumbing unit prices were highest at Governor Smith, 10.7 cents per cu. ft.

CONTRACT TOTALS AND UNIT PRICES ON PUBLIC HOUSING

1948-49 awards by N. Y. C. Housing Authority

Project Number **Project**	**(8)** **Glenwood**	(9) **Gun Hill**	(10) **Bronx River**	(11) **Pelham Parkway**	(12) **Patterson**	(13) **Todt Hill**	**(14)** **Nostrand**
Total Constr. Rooms	4,620	2,766	5,344	4,818	7,624	1,923	4,398
Total Apartments	1,188	738	1,246	1,266	1,791	502	1,148
Room per Apartment, Average	3.89	3.75	4.29	3.81	4.26	3.83	3.83
Total Cu. Ft	10,238,900	6,180,748	10,880,400	10,873,263	14,541,889	4,467,042	9,660,672
Award Date	11/26/48†	12/10/48†	12/22/48	12/30/48	1/7/49	1/18/49	2/3/49
Total Cost	....	....	11,401,329	12,627,056	15,426,805	5,729,475	....
Total Contract Cost	**10,764,796**	**6,225,931**	**10,669,796**	**11,665,142**	**14,223,876**	**5,308,211**	**11,121,959**
Cost Per Constr. Room	2,330	2,250	1,997	2,421	1,866	2,760	2,528
Cost Per Apartment	9,061	8,436	8,563	9,206	7,941	10,574	9,688
Cost Per Cu. Ft	1.05	1.007	.980	1.07	.978	1.188	1.15
Foundations and Superstructures	**8,203,686**	**4,593,152**	**8,161,000**	**8,801,000**	**10,887,000**	**4,050,157**	**8,369,000**
Cost Per Constr. Room	1,775.68	1,660.58	1,527.13	1,826.69	1,427.99	2,106.17	1,902.91
Cost Per Apartment	6,905.45	6,223.78	6,549.76	6,951.82	6,078.73	8,068.04	7,290.07
Cost Per Cu. Ft	.801	.743	.750	.809	.748	.906	.866
Heating	**898,600**	**562,600**	**809,000**	**1,049,800**	**997,400**	**442,937**	**1,189,777**
Cost Per Constr. Room	194.50	203.40	151.38	217.89	130.82	230.34	270.53
Cost Per Apartment	756.40	762.33	649.28	829.23	556.90	882.34	1,036.39
Cost Per Cu. Ft	.087	.091	.074	.096	.068	.099	.1231
Electricity	**364,170**	**217,330**	**394,760**	**405,000**	**469,500**	**193,829**	**333,000**
Cost. Per Constr. Room	78.82	78.57	73.87	84.05	61.58	100.79	75.72
Cost Per Apartment	306.54	294.48	316.82	319.90	262.14	386.11	290.07
Cost Per Cu. Ft	.036	.035	.036	.037	.032	.043	.034
Plumbing	**924,000**	**592,222**	**1,066,690**	**1,035,000**	**1,434,281**	**472,300**	**946,500**
Cost Per Constr. Room	200.00	214.11	199.61	214.82	188.13	245.60	215.21
Cost Per Apartment	777.78	802.46	856.09	817.54	800.83	940.83	824.48
Cost Per Cu. Ft	.090	.095	.098	.095	.099	.105	.098
Elevators	**374,340**	**260,627**	**238,346**	**374,342**	**435,695**	**148,988**	**283,682**

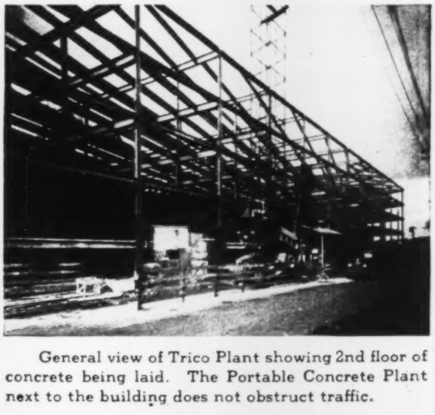
† Foundation contract date only. Cu. ft. cuantities used are preliminary—subject to minor revisions.



SIEGFRIED CONSTRUCTION CO. *Making Concrete on the Job* **AT TRICO PLANT, BUFFALO, N. Y.**

5 FLOORS • 5000 YDS • HIGH TEST CONCRETE

THIS Erie Portable Concrete Plant discharges each 1 yard batch to tubular tower, keeping buggy gang moving at top speed just behind the form builders and reinforcing bar teams. Aggregates are hauled 9 miles. Bag cement is stored under cover at the machine. One man operates weigh-batching of aggregate and water. Hydraulic control of all gates permits finger touch action. Second man feeds bag cement and supervises aggregate unloading to truck hopper which discharges to 60 ton/hr. vertical bucket elevator. Owner reports "a substantial saving on concrete laid will be effected on this 5,000 yard job". *Mounted on 8 pneumatic tires the plant can be quickly knocked down and towed to the next job.* Let's have your concrete making problem.



General view of Trico Plant showing 2nd floor of concrete being laid. The Portable Concrete Plant next to the building does not obstruct traffic.

Write for specific data on the Erie Portable Concrete Plant for your work.

ERIE

STEEL CONSTRUCTION COMPANY

193 GEIST ROAD • ERIE, PENNSYLVANIA

AVERAGE BID PRICES FOR HIGHWAY CONSTRUCTION BY STATES—FOURTH QUARTER, 1948

Projects Utilizing Federal-Aid Highway Funds
Public Roads Administration, Federal Works Agency

	Aver.	Ala.	Ariz.	Ark.	Cal.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Idaho	Ill.	Ind.	Iowa	Kans.	Ky.	La.	Me.	Md.	Mass.	Mich.	Minn.	Miss.	Mo.	Mont.
Roadway Excavation, per cu. yd.																										
Borrow	.72		.45		1.26	1.43	.66	1.29				.54	.51	.72			.38	.77	.77	.65	.50	.69	.47	.33		.92
Common	.37	.31		1.25			.55	1.21			.35		.51	.53	.23	.24		.43	.71		.40	.51	.28	.28	.45	
Unclassified	.48	.63	.99	1.00	.86	.61				.47	.38	.81	.88			.20	.57		1.09	.40			.28		.40	.41
Rock, Solid	1.40	1.00					1.80	14.00					2.41	4.00	1.64	1.83			4.09		2.66	3.22	1.04		1.47	
Structural Excavation, per cu. yd.																										
Common, Dry	3.14			2.12		2.55		5.00				2.24			3.10	5.87	4.24		1.54		5.33	1.69	3.98		4.68	3.59
Unclassified	3.88	4.15	3.04		4.87		3.34	4.80			5.12	13.35	5.00			2.28	4.08			3.01		7.08	2.92		3.21	28.60
Steel, per lb.																										
Pavement Reinforcement	.081						.075	.189					.067	.124				.085				.068				
Structural Reinforcement	.116	.113	.138	.147	.113	.144	.103	.096		.109	.096	.125	.128	.117	.124	.113	.100	.126	.138	.124	.118	.089	.127	.109	.116	.170
Structural Steel	.148	.219	.175	.200	.140	.160	.188	.149		.108	.110		.146	.148	.155	.143		.287	.150	.203	.138	.103	.156	.130	.147	.202
Bases, per sq. yd.																										
Gravel and Clay Gravel	.37	.35			.67	.24	1.27					.14	.88	1.90			.53	.79	.34			.31	.43	.31	.90	.32
Macadam or Stone	.99	.57					1.22	2.02		.95	1.01		1.03			.92	2.07		1.16		.57				.90	
Portland Cement Concrete	3.62						2.78	3.50					4.79					3.17				3.18			4.64	
Surfaces per sq. yd.																										
Gravel and Clay Gravel	.14			.56								.15	.35		.11	.08	.26			.46		.43	.12	.25	.13	.20
Bituminous Surface Treatment	.27	.29			.31			.39		.35	.39	.15						.43						.37	.20	.26
Bituminous Road-Mix	.45				.38							.38	.67			.55	2.80		.38							.47
Bituminous Intermediate Surfaces	.97	.51			.86		1.12										1.78		1.11		.93	.45				
Bituminous Concrete	1.16						1.43	1.49					1.65				1.26			2.73	1.48	1.29			.78	
Portland Cement Concrete	3.71						3.68	4.28					5.40	3.30	4.01	3.97	4.21					3.17	3.72	3.32	3.64	
Pipe per lin. ft.																										
Cast Iron, 18-inch	10.47																									
Clay, 6-inch	1.08						1.23								.65							1.07	.28			
Concrete Reinforced, 24-inch	5.59	5.32					4.45	5.32		4.91	4.73		6.27		5.09	4.38	4.14	5.99	5.50		5.81	4.82	5.04	4.44	5.04	6.56
Galvanized Iron, 24-inch	4.91		5.00		4.70	5.50					4.00	4.13	4.93	5.45	4.33	4.11	4.24	5.71	4.86	5.00		4.17	4.77		4.11	7.64
Structural Concrete, per cu. yd.																										
Superstructures	53.98	54.10	65.00	60.00	61.47	75.85	42.43	57.00		64.97	48.61		74.72	61.60	47.52	50.67	40.83	68.53	43.62	58.78	47.00	44.15	56.25	45.70	84.38	67.93
Substructures	49.97	65.52	52.63	56.55		74.50	42.49	51.35		71.89	46.81	42.72	80.85	58.00	46.14	37.22			39.07	53.97	47.00	43.06	51.45	54.29	46.08	57.77
Foundations and Footings	48.58	61.34			47.45	75.17	42.22	36.45		52.99	47.34			51.66			48.00			45.00	47.00	43.42	36.70			

	Neb.	Nev.	N. H.	N. J.	N. M.	N. Y.	N. C.	N. D.	Ohio	Okla.	Ore.	Pa.	R. I.	S. C.	S. D.	Tenn.	Tex.	Utah	Vt.	Va.	Wash.	W. Va.	Wisc.	Wyo.	Hawaii	Puerto Rico
Roadway Excavation, per cu. yd.																										
Borrow		.52	.61	.90		.69	.44	.38	1.06			1.09				.54	.38		.70	.63	.55	1.41	.52		2.70	.83
Common			.50	.79										.40			.43		.74		.33		.50			
Unclassified	.21	.63		4.32	.65	.74	.53	.19	.81	.40	.82	1.02		.26	.22	.50	.34	.50	1.19	.55		.79	.39	.34	1.01	.57
Rock, Solid			2.86	1.27			2.50										.92		3.08		1.22		4.00			
Structural Excavation, per cu. yd.																										
Common, Dry							8.39	5.27	4.48	5.41						2.46	2.50	2.06		7.63		5.63		3.73		
Unclassified	6.09	2.90	3.00	12.62	2.28	2.41	4.58	18.38	3.49	1.83	7.71	5.55			4.33	3.05	4.26	6.20	3.91	17.81	3.31	3.26	13.13	3.82	5.77	3.87
Steel, per lb.																										
Pavement Reinforcement					.300	.087			.075		.120	.078								.103	.120	.123				
Structural Reinforcement	.133	.133	.133	.165	.109	.126	.112	.140	.109	.098	.121	.117		.109	.123	.109	.106	.132	.120	.117	.120	.119	.120	.136	.166	.100
Structural Steel	.160	.167		.155	.150	.148	.140	.149	.157	.144	.180	.150		.150	.143	.120	.129	.268			.234	.132	.156	.159	.182	
Bases, per sq. yd.																										
Gravel and Clay Gravel		.23	.43	.74	.18	.52		.25	.97		.62				.49	.42	.35	.21	.58	.40	.50	.47	.34	.66		
Macadam or Stone				.93	.17	1.30	1.13		1.77		.33	2.13				.71				.76	.50	4.85			2.16	1.30
Portland Cement Concrete				3.40		4.01			4.16			8.22				3.18	4.04			3.25						
Surfaces per sq. yd.																										
Gravel and Clay Gravel	.09	.13						.15	.36	.22					.11	.40		.17			.29		.16			
Bituminous Surface Treatment			.19			.15	.43		.34	.14	.48	.67		.39	.42	.23	.18		.34	.24	.17					.35
Bituminous Road-Mix		.43	1.11		.41	.63			.55			.70				.43		.39	.92				.40	.55		
Bituminous Intermediate Surfaces		1.26		1.25		1.15	1.18		.78		.72	1.35						.89		.69					1.98	
Bituminous Concrete				1.53		1.40		.85	1.10		1.56	1.40				1.41	.44			.87		2.00			1.71	
Portland Cement Concrete				4.90		4.30	4.14	4.95	3.89	2.91	3.86	5.12				3.34	2.86	3.50		3.67		6.25				
Pipe per lin. ft.																										
Cast Iron, 18-inch				10.41		15.00						9.00														
Clay, 6-inch			.80			1.09			.79			1.75				.70										
Concrete Reinforced, 24-inch		5.74	5.72	7.32	5.95	7.68	5.03	4.92	6.05	4.62	4.00	6.53		3.83	4.73	4.91	4.27	4.62	5.00		4.50	5.01	5.00	6.00	8.30	5.00
Galvanized Iron, 24-inch	4.16	4.59		7.73	4.43	9.86	4.74	4.11	4.89	4.42	5.50	5.84			5.74	4.00	4.99	4.61	4.73	4.14				5.11		
Structural Concrete, per cu. yd.																										
Superstructures	54.36	50.73	45.00	72.93	60.00	56.20	63.13	58.80	69.05	38.11	59.21	74.08		54.92	48.90	49.18	41.62	52.37	49.82	58.49	56.24	59.39	58.34	56.47	76.56	34.98
Substructures	52.27	51.34	49.47	50.59	39.81	47.08	56.38	60.74	58.34	46.02	62.72	50.49		49.80	54.09	43.30	44.67	53.89	40.54	48.50	46.92	57.16	53.07	49.60	75.26	40.00
Foundations and Footings			41.88	47.49		49.52	58.58	61.33	54.08	48.71	59.35			60.44	56.38	47.09			39.00	40.27	49.05	51.75	52.63		44.99	22.86

Note: The rates shown are the weighted average contract bid prices for contract quantities reported on.

This building would

examples of changes made during construction at low cost

DUST COLLECTING SYSTEM —its exact location was not determined until after the building was well along.

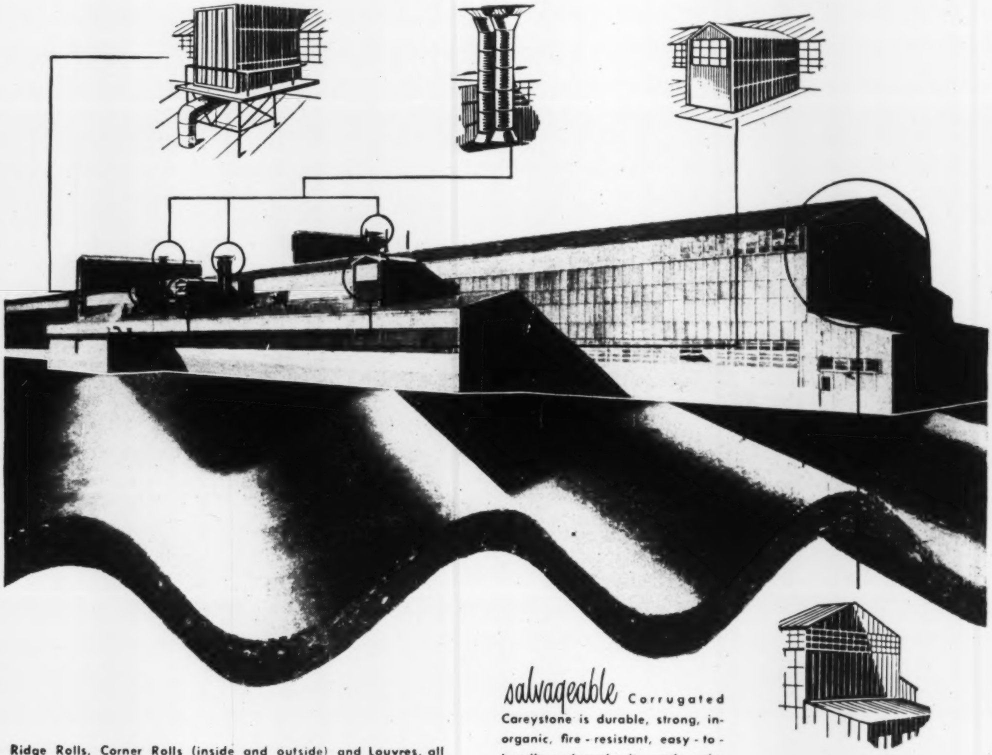
Due to the flexibility of Corrugated Careystone, even major changes and additions were made quickly and with relative ease and economy.

STACKS — to take off exhaust from paint and ceramic coating spray booths.

Careystone's resistance to fumes and heat made these additions practical and economical. No special protective materials were necessary.

PENTHOUSES—to house vertical conveyors at temperatures up to 150° F.

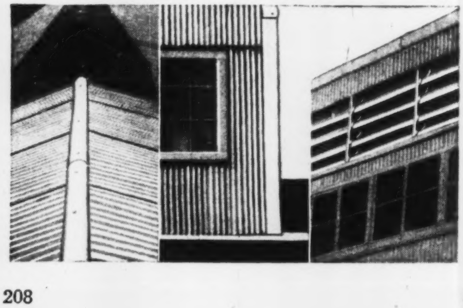
New wall openings made after walls were in place . . . with a minimum of time and expense. All Corrugated Careystone was reused in the new plan.



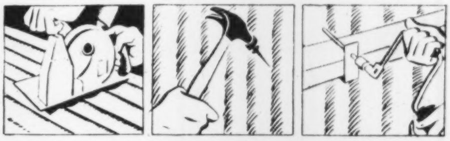
salvageable Corrugated Careystone is durable, strong, inorganic, fire-resistant, easy-to-handle and apply. Its modern design fits it for modern interiors and modern exteriors—for a new kind of modern construction.

END WALL—designed for future expansion. Wall can be dismantled and Corrugated Careystone reused if building is extended to gain more floor space.

Ridge Rolls, Corner Rolls (inside and outside) and Louvres, all made of Asbestos-Cement, are available from Carey in sizes to fit all construction requirements



easy application



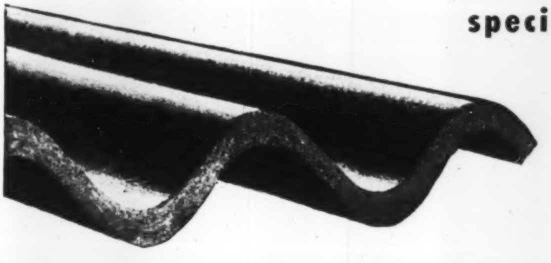
SAW IT **NAIL IT** **BOLT IT**

cost you 40% less, too, with Careystone

We built this plant with our own products . . . to make more products to build more plants! We estimate we saved as much as 40% over conventional masonry construction by using Careystone Corrugated Asbestos-Cement Sheets. This should be real news for you—especially if you are making plans for a new building or changes in present ones. We needed to get a new plant into operation quickly. We did it by building it with Corrugated Careystone.

For commercial and industrial building and for all light-weight construction, we know of no building method that takes less time in erection; that withstands weather any better; that offers more flexibility in usage or expansion; that requires less maintenance; that provides more protection from fire, weather, decay and rot; or that costs less.

Most plants undergo some changes while under construction. Buildings built with Asbestos-Cement Careystone, Corrugated or in flat sheets, cost less to change, cost less to build, cost less to maintain!



SEE FOR YOURSELF. Write Carey for "Manual 808"—address Dept. 000

specifications of corrugated Careystone

FOR WALLS • ROOFS • PARTITIONS

1. 4.2" Corrugation. 2. Approximately 3/8" thick 3. Weight: 3.75 lb. per sq. ft. 4. Length: Up to and including 12'. 5. Width: 42" 10 corrugations. 6. Maximum purlin span 4'6". 7. Maximum girt span 5'6".

Enclosure strips, fasteners and accessories, made especially for use with Corrugated Careystone, can also be furnished by Carey.

Flat Asbestos-Cement Sheets
85% Magnesia • Asbestos
Industrial Rock Wool
Pipe Coverings
Blocks • Batts • Papers
Built-up Roofing
Roof Coatings
Highway Products

Carey

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1557 MacKay Street, Montreal 25, P. Q.

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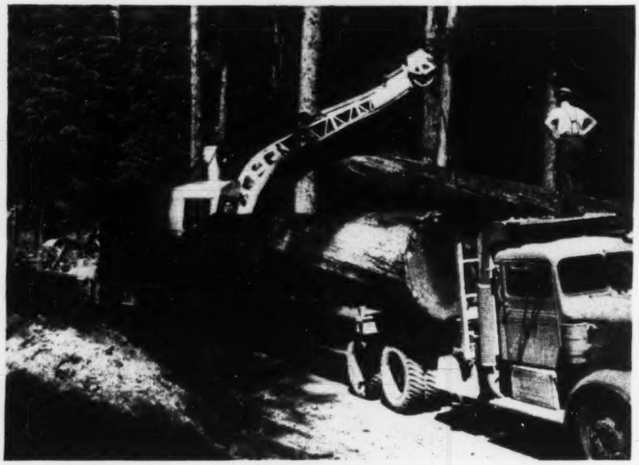
THE PHILIP CAREY MANUFACTURING CO., CINCINNATI 15, OHIO

NEW PRODUCTS



Track-mounted Loader

This 71-ton "Trakloader," shown in the photograph loading logs on a truck trailer on a Simpson Logging Co. operation near Grisdale, Wash., has increased mobility of logging operations and is said to be of use on large construction projects. It is powered with a 200 hp. Cummins diesel motor and has a rated lifting capacity of 50 tons. It is equipped with a twin-disc torque converter, planetary two-speed drive and a 28-ft. goose-neck heel boom.—WASHINGTON IRON WORKS, SEATTLE, WASH.

Crane for R. R. Work

Model 205 Rail-Aid excavator is a specially designed rail propulsion car used with a crawler type crane for railroad work. The outfit consists of a crane, dragline, shovel and pull shovel. It is secured in position on well type propulsion car. It unloads quickly and easily. It is a useful labor aid for the road gang relaying and unloading rail, handling materials and timbers on bridge repair projects, and many other jobs. With dragline bucket suspended from the crane boom, Rail-aid does a fast job of cutting down an embankment, removing slides and ditching for better drainage. The crane moves off the propulsion car, whenever that becomes necessary, for a better operating position. It can be unloaded in 10 minutes.—KOEHRING CO., 3026 N. CONCORDIA AVE., MILWAUKEE 10, WIS.

Comminutor

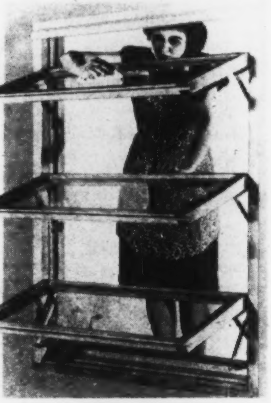
The Worthington comminutor is a device for cutting or shredding coarse solids directly in the flowing raw sewage. A screen, a mechanism for comminuting the screenings, and an electric weatherproof motor comprise the vertical, compact unit. Because the sewage is permitted to flow straight through the vertical comminutor screen no special channel construction is required. The comminuting unit is easily installed in any existing channel, requiring only a provision for four foundation bolts and a slight streamlining of the downstream channel to receive the comminuted sewage as it comes out.—WORTHINGTON PUMP AND MACHINERY CORP., HARRISON, N. J.

Rubber Traffic Cones

These cones have the appearance of steel yet are made of safe, collapsible rubber. One of the most outstanding features is the durable flexible construction which means infrequent replacement because of breakage, distortion or wear. Lightweight construction makes them easy to handle and it has been found that traffic barriers can be set up in 1/10 the time. Many hundreds of them can be stacked and stored in a minimum of space when they are not being used. —ENTERPRISE DEVELOPMENT CORP., BURBANK, CALIF.

Portable Electric Hand Lamp

Lamp with 6-in. diam. head of chromium-plated 20-gage steel with triple-silvered reflector throws powerful 2,000-ft. beam. A built-in charger plugs into any 110-volt, a.c. circuit to make recharging the battery easy. Spillproof rechargeable battery with acid-proof plastic case does not leak whether lamp is held upside down, sideways or in any other position. Head has swivel attachment vertically with 170-deg. range. Charge indicator eliminates guesswork on condition of battery and does away with hydrometer tests.—U-C LITE MANUFACTURING CO., 1050 WEST HUBBARD ST., CHICAGO 22, ILL.



Awning-type Wood Window

An awning-type window is being marketed for use in light and heavy construction. A mechanism lowers each vent from the top as it opens outward. This permits easy cleaning; provides 100% controlled ventilation draft-free air circulation. Complete adjustment of the vents permits the directing of fresh air intake and exhausts stale air without causing drafts. Rain will not enter. Bronze weather stripping at top and bottom of sash assures a completely weathersealed and dust-proof window when closed. Operated by a crank below the stool, windows may be opened only a fraction of an inch or a full 85 degrees. The mechanism locks the window in any desired positions, making it burglar proof from the outside and safe for children inside. Screens and windows are easily put on the inside, from the inside.—SUPER VENT CO., 905 W. WORTH AVENUE, CHICAGO.

Rolling Steel DOORS

MAHON POWER OPERATOR

Manually • Mechanically • Power Operated

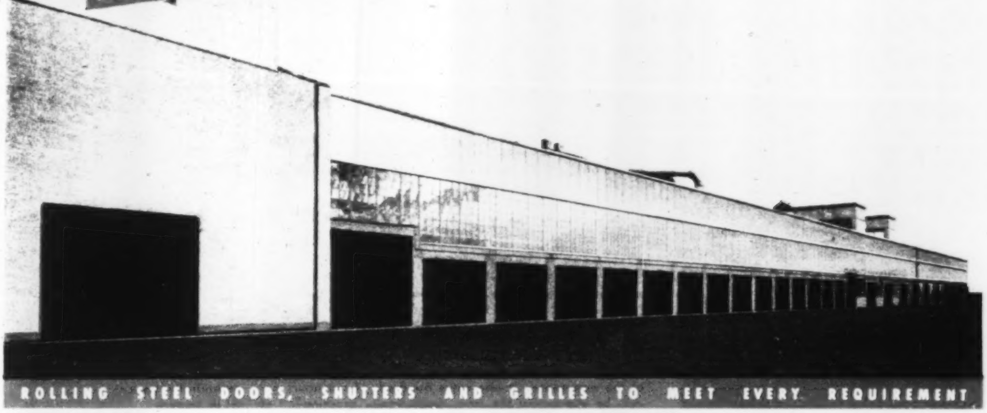
No door offers the inherent advantages of a good Rolling Steel Door . . . no other type of door offers the permanence of all-steel construction, the saving in space adjacent to door openings—and, most important, the satisfaction born of a lifetime of trouble-free door performance. These advantages are realized to the fullest degree in Mahon Rolling Steel Doors . . . comparison of details of construction and materials employed at critical points will reveal a greater door value . . . exclusive Mahon features will be found very desirable from an everyday operating standpoint. See Mahon's Insert in Sweet's Files for complete information, details and specifications.

THE R. C. MAHON COMPANY

Detroit 11, Michigan • Western Sales Division, Chicago 4, Illinois

Representatives in All Principal Cities

Manufacturers of Rolling Steel Doors, Shutters and Grilles, and Mahon Steel Deck for Roofs, Sidewalls, Partitions, Acoustical Ceilings, Permanent Floor Forms and Oversize Doors.



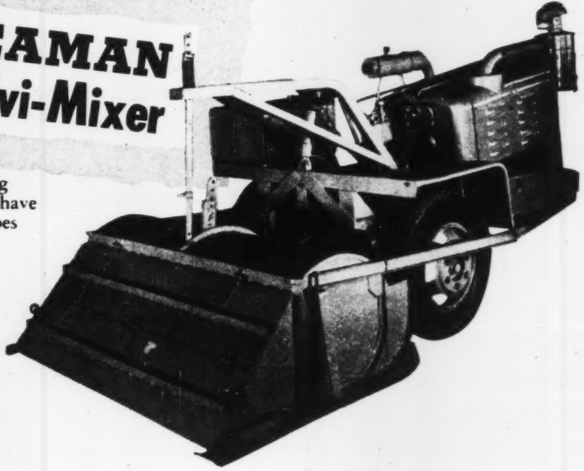
ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

Seventy Five Mahon Rolling Steel Doors are installed in the new building illustrated above, which was built by Spence Bros., Gen. Contrs. Saginaw, Mich., for a large midwestern Foundry Company.

MAHON

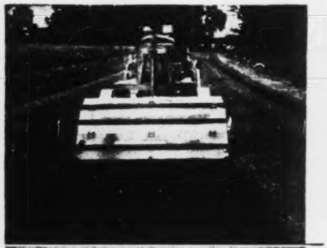
Base Your Estimates on a

SEAMAN Pulvi-Mixer



Get the real "low-down" on mixing costs — check the records Seaman Mixers have been making all over the country on all types of jobs.

Here is a mixer that is versatile . . . can handle a wider variety of mixing and pulverizing jobs . . . costs less to own and operate than any other type . . . that does as much work per hour as the largest machines and produces a mixture of the highest quality by actual test. Before you start your next job — get the facts from Seaman.

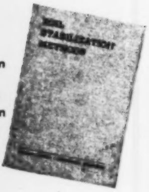


Bituminous

The Seaman Pulvi-Mixer handles all types of bituminous mixing with equal efficiency either in-place or from windrows, on new construction or resurfacing jobs.

Processing with a Seaman assures a mix of uniform density; LATERALLY . because of the pitch of the tines, LONGITUDINALLY . because of the forward carry-over in the hood; VERTICALLY because of the adjustable depth control. You blend out "rich" and "lean" spots — compensate for variable aggregates — aerate excessive moisture in materials — and leave a shaped, level, graded surface ready for rolling.

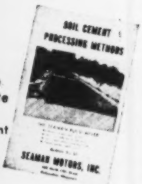
Send For Bulletin No. 25. A new, authorative, 85-page booklet on all types of Soil Stabilization Methods.



Soil-Cement

In soil-cement processing, the quality of mix is extremely important — the soil must be finely pulverized, the cement and water thoroughly dispersed and mixed into the soil to form a homogenious mixture that can be readily compacted. The Seaman mixer on each trip pulverizes, mixes and remixes the materials to obtain the uniform blending possible only with multiple passes. The high velocity rotor disperses the materials vertically, laterally and longitudinally from the sub-grade to the surface over the entire processing area.

Send For Bulletin No 50. A complete treatise on the latest Soil-Cement processing methods.



Macadam

The stronger the base, the better the road That is why more and more Macadam base roads are being built with Pulvi-Mixers which assure uniform depth and blend of the aggregate and prevent segregation and stratification of the materials.

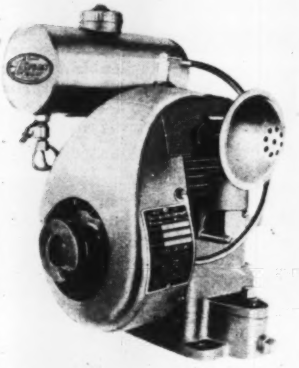
The Seaman disperses the fines from top to bottom, filling the voids and assuring a more positive keying and locking of the aggregate It also saves hundreds of manhours per mile by eliminating the slow, costly hand "brushing-in" of the fines. The Seaman leaves a thoroughly blended, homogenious texture ready for immediate compaction.

Send For Bulletin No. 60. An authoritative booklet on modern Macadam construction methods.

MACADAM BASE CONSTRUCTION METHODS
SEAMAN MOTORS, INC.

SEAMAN MOTORS, INC.

281 NORTH 25th
MILWAUKEE, WISCONSIN



Lightweight Gasoline Engine

A new, lightweight gasoline engine, weighing only 23 lb., Model LMC, has been developed. It is particularly suited for powering portable equipment, and is also readily adaptable for use on pumps, compressors, sprayers, small generators and similar applications. Important features of this light weight engine include ball bearings on the crank-shaft, float feed, automotive-type carburetor, fly ball governor and high tension magneto. The engine has a bore of 1⅝ in. and a stroke of 1½ in., with a piston displacement of 3.11 cu.in.—LAUSON CO., NEW HOLSTEIN, WIS.

Bar Bender

On the job cold bends of copper, aluminum, brass and mild steel bar and strip through a complete range of sizes from ⅛ in. x 1 in. to ½ in. x 6 in. are possible with the recently developed Form-Bar Bender. It is portable, simple to operate and requires no special training to operate in making bends up, down, sideways and twists. Short offsets and "Z" bends

TRY US FIRST
—when you need High Strength Steels

During these days of short supplies, it pays you to "Try Us First" for High Strength Steels — "the steels that do more." For, when you use U·S·S COR-TEN or U·S·S MAN-TEN instead of carbon steel, your steel supply will go *one-third* farther!

The reason is simple: The higher physical properties of these high strength steels make it possible for you to use thinner sections to produce units that weigh one-fourth less; that are substantially stronger and more durable; that require one-fourth less steel per unit. So, in many cases, you can produce as much as one-third more units from every ton of steel used. And, since both U·S·S COR-TEN and U·S·S MAN-TEN, like plain carbon steel, can be readily fabricated—since one-fourth less steel is required per unit, with consequent reduction in shipping costs — since fixed charges can be spread over one-third more units, your finished product can be built at little or no increase in cost.

Our warehouses and sales offices, coast-to-coast, have U·S·S COR-TEN and U·S·S MAN-TEN steels in stock. Our other High Strength Steels—U·S·S ABRASION RESISTING and U·S·S MANGANESE-NICKEL-COPPER — are also stocked for your needs. Fill in and mail the coupon *NOW* for free booklets on U·S·S High Strength Steels.

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Dept. B-3-17, 208 S. La Salle St., Chicago 4, Ill.

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Also Sales Offices at: KANSAS CITY · PHILADELPHIA · TOLEDO · TULSA · YOUNGSTOWN
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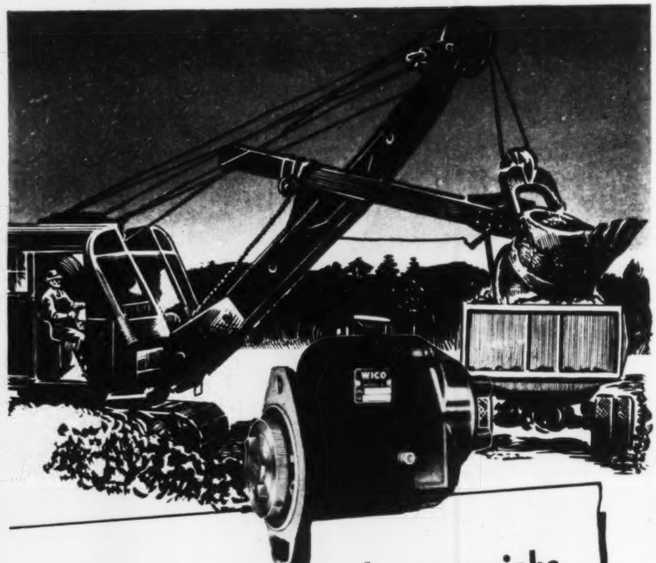
UNITED STATES STEEL



For those rough, tough power jobs

HERE'S A NEW, COMPACT WICO *heavy duty magneto*

No matter how many hours of continuous service you need . . . no matter how much dust or dampness . . . your engine will get the regular, hot spark it needs from this WICO Model XHD magneto. It's a *new* magneto, designed to do the hard work you need done. It's compact. The molded, insulated coil is stronger so there's less chance of breakdown. This solid plastic case is far tougher than a tape winding. A specially made bronze bushing and ball bearing, lubricated for life, insure trouble-free service. The large — 3/16" — tungsten contacts resist fouling and wear longer. Built-in impulse coupling. On flange-mounted models, a Buna-N oil seal prevents leakage. Available for 4 or 6 cylinder engines, flange or base mounted.

This *new* WICO Model XHD is the finest magneto available for engines operating in continuous service under the most adverse conditions that require ignition units of exceptional stamina and ruggedness.

If you've had ignition trouble, chances are this economical WICO XHD will change that. Ask your equipment dealer, or one of WICO's more than 2,000 authorized service stations. Wico Electric Company, West Springfield, Massachusetts.

WICO SINCE 1897 DEPENDABLE IGNITION

can also be made and a positive set-up for repeated "pre-fab" duplicate bending is included. A vertical mounting makes the tool flexible for handling the longest length of material on any kind of a job.—WINFIELD R. SCOTT, 234 SOUTH 11TH STREET, NEWARK, N. J.

Masonry Cutting

Continued research in the field of masonry cutting has developed new and highly efficient Clipper masonry saw models, incorporating such production speed-up features as the "Adjust-A-Cut" control for instantaneous one-man adjustment of the cutting head; "Streamlined" ball bearing conveyor cart—precision balanced and designed—with aluminum alloy castings and a new improved "Snap-on" blade guard cover. Three separate units—the cutting head assembly, the saw frame and conveyor cart (none weighing over 154 lb.) make Clipper saws easily portable from one operation to another.—CLIPPER MFG. CO., (EN 49), 2800 WARWICK, KANSAS CITY 8, MO.

Air Jet Muffler

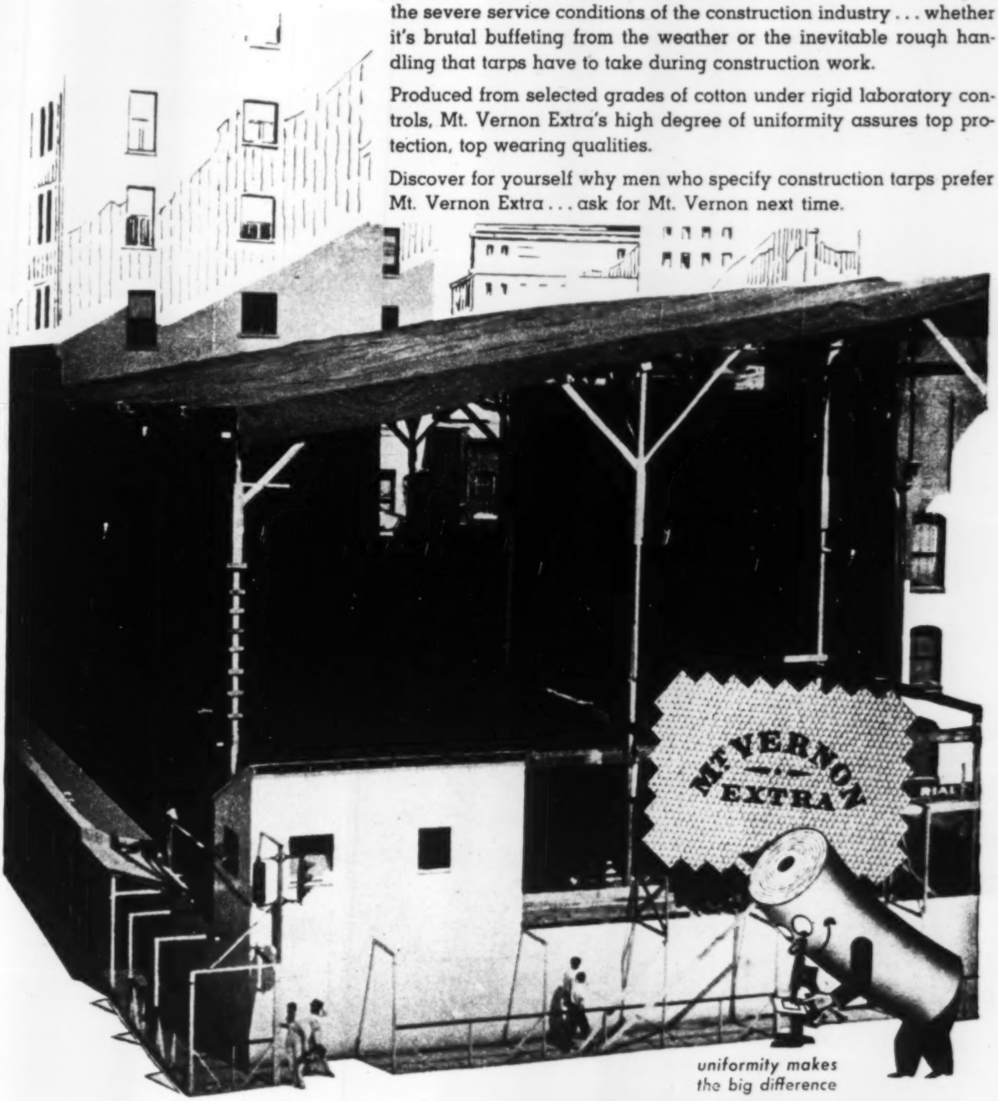
Savings in fuel consumption up to 15 percent are claimed for this heavy-duty muffler. The main purposes of this air jet muffler are to eliminate back pressure on the engine, reduce exhaust smoke and stop loud exhaust noises. It is slightly larger than ordinary types to accommodate a double-shell and orifice arrangement through which air is drawn, proportioned and introduced into the exhaust stream. Road tests showed cooler engine operation on long grades and reduced engine maintenance, the company claims. Sizes up to 175 hp. are available.—U. S. FLEXIBLE METALLIC TUBING CO., 63 MAIN ST., SAN FRANCISCO, CALIF.

A Roof that Can *Rough* It

Tarps made of **Mt. Vernon Extra** have what it takes to stand up to the severe service conditions of the construction industry . . . whether it's brutal buffeting from the weather or the inevitable rough handling that tarps have to take during construction work.

Produced from selected grades of cotton under rigid laboratory controls, Mt. Vernon Extra's high degree of uniformity assures top protection, top wearing qualities.

Discover for yourself why men who specify construction tarps prefer Mt. Vernon Extra . . . ask for Mt. Vernon next time.



uniformity makes
the big difference

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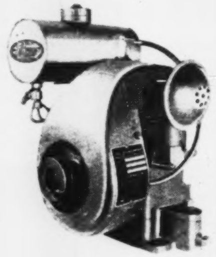
LAUSON POWER
is DEPENDABLE Power!



- Lauson dependability gets the job done — provides plus power for pumping, vibrating and countless other construction jobs.
- Sizes from ¾ to 5 H. P. 4-Cycle, Air-Cooled.
- Light weight — instant starting — economical operation.
- Machined mounting pad on crank case for direct mounting of pumps, generators, etc.

NATION-WIDE LAUSON SERVICE
AVAILABLE EVERYWHERE

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ENGINE BUILDERS FOR OVER 50 YEARS!

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with SMOOTH CEILINGS SYSTEM •

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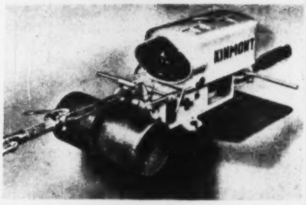
KAPIOLANI BOWL
BUILDING
24 OFFICES 8 STORES 20 BOWLING LANES
AIR CONDITIONED THROUGHOUT

● THE SMOOTH CEILINGS SYSTEM ideally lends itself to cantilever balcony construction so typical of modern buildings. The special steel grillages may be used with reinforced concrete, structural steel, or steel pipe columns, and are especially adapted to flat slab construction. Reduces cost of form work and cost of installing mechanical equipment. Saves space by eliminating beams and column capitals.

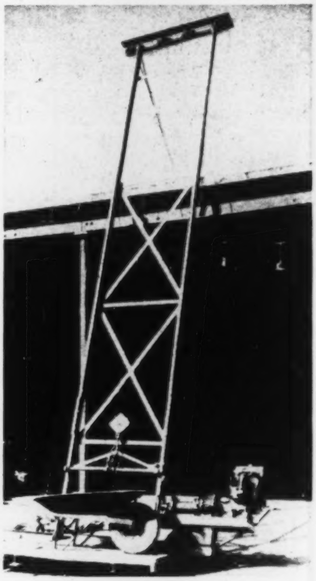
WRITE TODAY FOR FURTHER INFORMATION

SMOOTH CEILINGS SYSTEM CO.
802 Metropolitan Life Bldg. Dept. A Minneapolis, Minn.



Cutting Torch Attachment

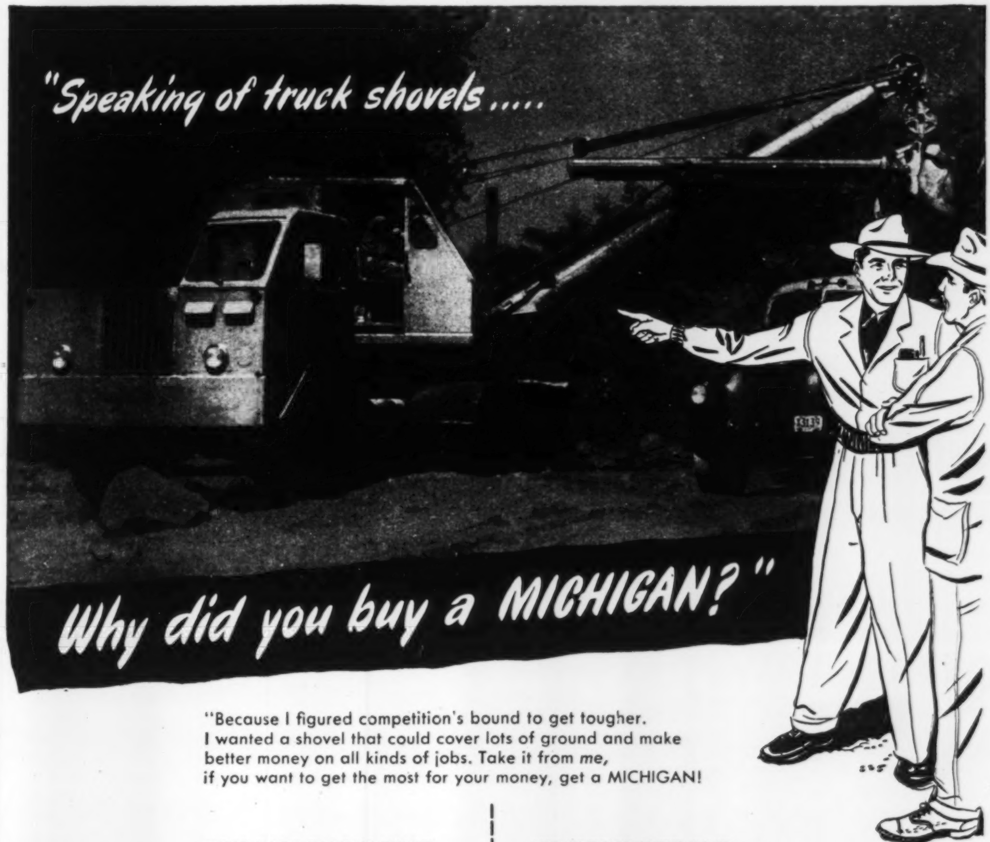
A new attachment for the Kinmont Universal Power Unit is now available. It provides for fast adjustment of the cutting torch in handling a wide range of pipe sizes; the maintenance of a smooth bevel; and making a square cutoff across the end of the pipe. It can be used on any pipe size from 3 in. to 36 in. dia., and on tanks up to 10 ft. dia. when turned on a roller rack.—KINMONT MFG. CO., INC., W. WILSON AVE., GLENDALE 3, CALIF.



Ladders on Wheels

Power for these versatile units is provided by compact, rugged electric or gasoline engine-driven installations that assure consistent, efficient operation under the most rigorous conditions. Remote control attachments permit these CMC Roll-o-Hoists to be operated from any level. Also, automatic stops make it possible to load or unload at intermediate level at intermediate levels. A safety device controlled by the counter-balanced weight of the platform stops a full load within

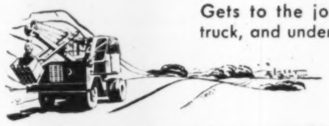
(Continued on page 219)



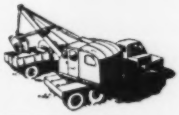
"Speaking of truck shovels.....

Why did you buy a MICHIGAN?"

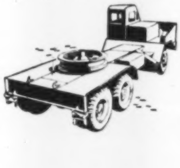
"Because I figured competition's bound to get tougher. I wanted a shovel that could cover lots of ground and make better money on all kinds of jobs. Take it from *me*, if you want to get the most for your money, get a MICHIGAN!



"IT'S FAST ON THE ROAD—
Gets to the job as fast as a truck, and under its own power.



"IT MOVES DIRT FAST—
Anyway you look at it, it's *yardage* that counts. MICHIGAN'S 5.4 RPM swing and fast air clutches give you the extra yards a day you're after.



"IT'S *REALLY* BUILT—
Any time you put a shovel on a truck you need a chassis that's designed for the job. And MICHIGAN *knows how*—they've built their own chassis for years.

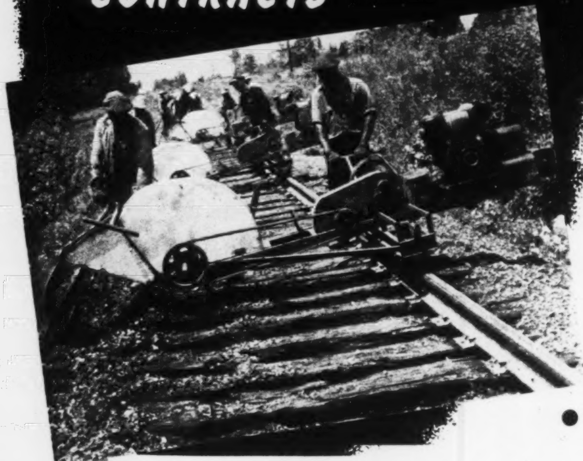
"IT'S EASY TO HANDLE—
You know that if a machine is rough on the operator he'll probably be rough on the machine. MICHIGAN'S air ram clutches are fast and easy. They take the work out of operating. That's why my operators like to run the MICHIGAN."

See MICHIGAN Truck Shovels at work on jobs like yours — write for Bulletin 100, "On The Job with MICHIGAN."

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY, 500 Second Street, Benton Harbor, Michigan, U. S. A.

PUT NATIONALLY-KNOWN *Experts* TO WORK ON YOUR *Trackwork* CONTRACTS



- **RELAYING**
- **REHABILITATION**
- **ABANDONMENTS**
- **TRACK STRIPPING**
- **BALLAST CLEANING**
- **TRACK CONSTRUCTION**

On original projects or subcontracts . . . a few feet or a hundred miles, where there is railroad trackwork to be done, it is a job for Royce Kershaw Co., Inc.

Twenty-five years of specialized experience on contract trackwork throughout the United States and Central America provides a solid background of skill and financial responsibility to handle contracts of any size and to produce top quality completed work—on schedule.

Use of Kershaw Trackwork Equipment and modern engineering and time study methods cut overall costs to such an extent that a number of major railroads find trackwork by Kershaw more economical than using their own crews!

If you have trackwork coming up this year . . . or next . . . get complete information from Kershaw now.

ROYCE KERSHAW CO., INC.

RAILROAD CONTRACTORS

P. O. BOX 510 **MONTGOMERY, ALABAMA**

Twenty-five years of "working on the railroads"
From 900 foot spurs to 80 miles of main line.

stand 5,000 lb. eliminates the danger of breakage due to overloading. Modifications such as front loading platforms and tip-over buckets have been incorporated to expedite production and lower operating costs. Available in four different models varying in lifting capacities.—CONSTRUCTION MACHINERY SALES CO., WATERLOO, IA.

Mobile Crane

Model 8502, illustrated, is a 7½-ton crane powered by a Ford V-8, 47 hp. gasoline engine. It has a turning cycle of 40 ft. and will travel at 2 mph. loaded and 4 mph. unloaded on level ground. Motions are hoisting, swinging, derricking and traveling—each operated by separate single motors, all of which can be operated simultaneously. Unobstructed view from the cab. Clamshell buckets, magnets, demolition balls, etc., are available for any materials handling job, and dealers will be stocked with spare parts.—COLES CRANES, INC., 4301 SOUTH PAULINA ST., CHICAGO 9, ILL.

Machinery Hauling Trailer

This trailer is built for rugged duty. The tilt top platform makes for easy loading—no jacks, cribbing or skids required. One-man operation. Model B, illustrated, is of 10-ton capacity. It comes completely assembled with platform, side angles, stake pockets, dual wheels, pintle eye hook, and 4 tires 8.25 x 15 x 14 ply.—RAY MILLER RESEARCH ENGINEERS, 4,320 W. MARTIN DRIVE, MILWAUKEE 8, WIS.

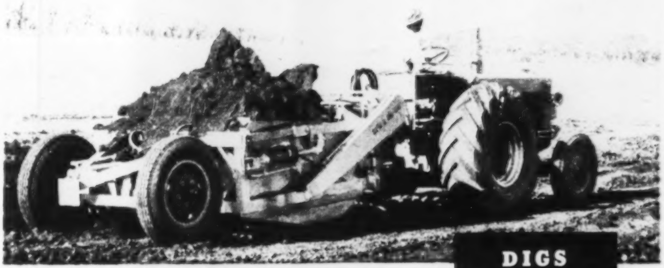
Building Paper

A new development in building paper is a roll 10 ft. wide, 100 ft. long, and weighing 60 lb. Made out of an unbroken sheet 10 ft. wide, the "Skufpruf Ten" eliminates the ex-

With pay loads like these...

BE-GE SPEEDHAULS

pay off in PROFITS!



DIGS
CARRIES
SPREADS
DUMPS

Move more dirt per trip . . . make more trips per hour with fast loading, fast dumping BE-GE "Speedhauls"! Engineered by practical earth moving men and constructed to achieve maximum "on the job" efficiency . . . these fully hydraulic scrapers are designed to operate profitably in all materials.

Self-loading, full carry BE-GE "Speedhauls" have *controllable* cut and spread. Tractor operator with a clear view of the blade instantly regulates the CUT, LIFT, SPREAD, and DUMP operations of the Speedhaul with finger-tip hydraulic controls. Fast, clean dumping or spreading is accomplished by forced "roll-out" ejection . . . uniform depth of cut in *all materials* by positive hydraulic down pressure on the blade.

TOP PHOTO: ST Model Speedhauls for crawler tractors available in 3, 4.5, 6, 8, 10 and 13 yard capacities.

LOWER PHOTO: SS Model Speedhauls for industrial wheel tractors available in capacities of 3, 4.5 and 5 cubic yards.

See your nearest Tractor dealer for full details or write Dept. ENR.

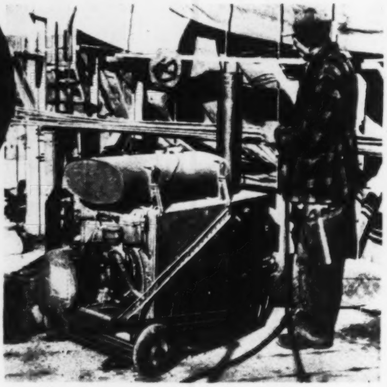
BE-GE MANUFACTURING CO.
GILROY, CALIF. CHATTANOOGA, TENN.

pense of lapping narrow rolls together. Other features are its light weight, ease in handling and storage. A piece easily cut off the roll makes a strong, waterproof, scuffproof, shrink-resistant tarp. The roll covers 40% more area in the same operation than a 7-ft. wide roll. — THE RICHKRAFT CO., BUILDERS BLDG., CHICAGO.

Packaged Pipe Line

A "packaged" light weight pipe line for temporary or semi-permanent installations of water, gas, or air lines has been announced as available for sale or rental. The "Speed-lay Pipe System" consists of three parts: Pipe, featuring light weight, uniform lengths, and easy makeup; fittings to meet any requirement; and valves easily assembled on the line. The pipe is used for pressures up to 150 psi. and is furnished in sizes from 2 to 6 in. and in lengths of 20 ft., easily handled by one man. Ends of pipe are prepared for victaulic couplings, one to each length of pipe. A few turns of the wrench and the coupling is made up. Outside screw and yoke or non-rising stem gate valves in either flange or screw type may be specified. Users save in material, transportation, handling and labor costs.—ALBERT PIPE SUPPLY CO., INC., BERRY AND NO. 13TH STS., BROOKLYN 11, N. Y.

HEAT



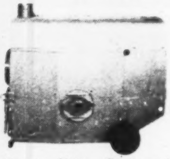
WHERE YOU WANT IT--- WHEN YOU WANT IT---
without waste

THE ORIGINAL HERMAN NELSON GASOLINE-BURNING PORTABLE HEATER

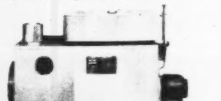
- **Provides Quick, Clean, Safe Heat— *without soot, fumes or open flame!***
- **Abundant *fresh*, heated air — *forced* to areas where most needed!**

These time-tested, job-proved Portable Heaters step up winter production by eliminating delays caused by cold weather. Can be used for countless applications requiring temporary or emergency heat. Especially suited to jobs requiring a self-contained, self-powered heating unit. Full 250,000 BTU per hour capacity — enough to heat three ordinary five-room houses — yet no bigger than a kitchen stove!

Also Available



New Herman Nelson De Luxe Model Portable Heater—Oil Burning—Electric Motor Powered—Automatic Ignition—250,000 BTU per hour.



New Herman Nelson Economy Model Portable Heater—Oil Burning—Electric Motor Powered—Low First Cost — 125,000 BTU per hour.

Write for Interesting Free Booklet on "COST CONTROL"

THE HERMAN NELSON CORPORATION MOLINE ILLINOIS

SINCE 1906 MANUFACTURERS OF QUALITY HEATING AND VENTILATING PRODUCTS

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you'll find it easier, faster if you...

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When you need specific information on materials, equipment or services, reach for your Sweet's File, Engineering (the big blue file). It contains 330 manufacturers' catalogs full of useful information on thousands of products . . . from absorbers—gas, to zinc galvanizing. Cross indexing speeds finding.

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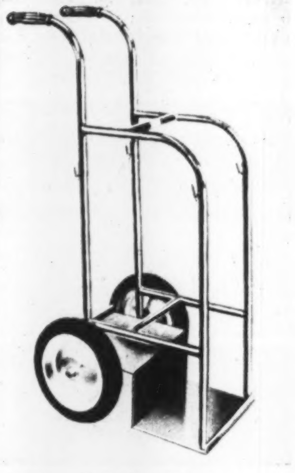
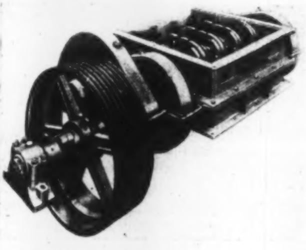


Welding Cylinder Trucks

Trucks to carry any size welding cylinder in tandem or side by side, are included in this line. Trucks are available with close fitting welded wide spoke steel wheels or with the finest ball bearing, rubber tired, industrial wheels.—ADAMS MFG. & SUPPLY CO., 1522 N. INDIANA ST., LOS ANGELES 33, CALIF.



Preliminary Crusher

The Eagle double roll preliminary crusher has been redesigned for reducing hard fire clay, flint clay, shale and other material. The basic principles of a combined hammer mill operating at comparatively slow speed and a cutter and crusher have been retained to provide trouble-free, high output preliminary reduction of the toughest materials.—EAGLE IRON WORKS, 129 HOLCOMB AVE., DES MOINES, IOWA.

Weed Killer

Arsenical weed killers (TRIOX) are highly toxic to vegetation and retain weed-killing power in the soil for a long time. They can be applied any time of the year, although best results are obtained at the beginning of the rainy season when weeds are starting. One application at that time poisons the soil, killing weed seeds and usually

Introducing...

JOE RAMSETTER!

If you don't know JOE RAMSETTER, you're missing a profit-maker. Joe carries the sharpest pencil you ever saw, for cutting costs and saving time on fastening jobs in steel, concrete, brick, other hard materials. It's the RAMSET FASTENING SYSTEM.

No chipping! No drilling! No plugging! Not for Joe! In 30 seconds, he prepares the tool, then places it against the work, taps it—and RAM! It instantly sets pins and threaded studs up to 6" long and ⅝" diameter. It's fast, it's tight, it's as economical as reading a newspaper over a neighbor's shoulder.

Five pounds of RAMSET TOOL do the trick. Self-contained, completely portable. Easy to use. In 30 minutes, we teach any good, careful workman to RAMSET up to 50 fastenings per hour.

RAMSET SYSTEM saves so much time and money you won't believe it until you see it. Better send for Joe to demonstrate on your own jobs. Just mail the coupon.

Ramset
FASTENING SYSTEM

Stemco Corporation,
Cleveland 16 (Rocky River), Ohio.

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EN-3

Stemco Corporation,
Cleveland 16 (Rocky River), Ohio
Please have JOE RAMSETTER show us how to save time and costs on fastening jobs.

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ECK MILLER OF OWENSBORO, KENTUCKY

DOES IT WITH A **ROGERS**

using a Rogers Model D-35-D and a Pole Type Trailer loaded with 80,000 lbs. of steel tank 67 feet in length. The conventional trailer mounts a fifth-wheel type of bolster which supports the front of the load and tows the pole trailer which carries the rear of the load.

A. B. BURTON CO., Inc. OF LYNCHBURGH, VA.

DOES IT WITH A **ROGERS**

Moving this heavy Northwest power shovel from job to job presents no problem to the A. B. Burton Co. when they have their D-50-D Rogers semi-trailer to rely upon.

DUIE PYLE OF COATSVILLE, PA.

DOES IT WITH A **ROGERS**

Another 40 tons of tank 70 feet in length is rapidly, transported the 70 mile distance from Lancaster, Pa., to Telford, Pa., with a Rogers popular D-35-D semi-trailer and a PT-15 pole trailer taking the job "in stride".

***and* YOU CAN DO IT WITH A ROGERS** trailer, whether the jobs involved require the hauling of light, medium or heavy equipment. Why not learn in detail just what Rogers has to offer. Write TODAY for your copy of the NEW CATALOG.

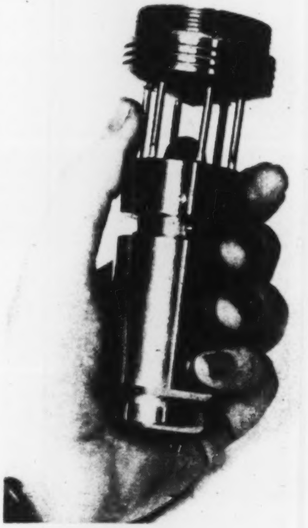
ROGERS BROS. CORP.

DESIGNERS and BUILDERS OF HEAVY DUTY TRAILERS SINCE 1915

EXPERIENCE builds 'em *PERFORMANCE sells 'em*

135 ORCHARD ST. ALBION, PENNA.

giving reliable weed control for more than one year. "Spot" treatments can be made seasonally or annually to prolong weed control indefinitely. For an economical and thorough job, low pressure (100 to 150-lb.) power equipment is recommended, though sprinkling carts may be used or, for small areas, a sprinkling can.—CALIFORNIA SPRAY-CHEMICAL CORP., RICHMOND, CALIF.



Hydrostatic Impulse Gage

Mechanical, self-recording gage may be lowered into a well or connected to a pressure chamber to measure directly the total impulse per unit area generated by pressure waves resulting from underground explosions or other high pressure sources. The hydrostatic impulse forces mercury through a capillary passage and into a collector; weight of mercury discharged is proportional to the impulse per unit area in psi-sec, from 10 to 400 psi. The gage is entirely self-contained and of simple construction, for convenience in field use. Its applications include geophysics, blast damage determination, and water hammer research.—ENGINEERING RESEARCH ASSOCIATES, INC., ST. PAUL 4, MINN.

Motor Starter

A new magnetic motor starter and magnetic contactor to give maximum protection to alternating current motors up to 50 hp., 440 V, has been placed on the market. It is claimed that it will provide longer contact life, greater protection and quiet operation. Two outstanding features are the relay

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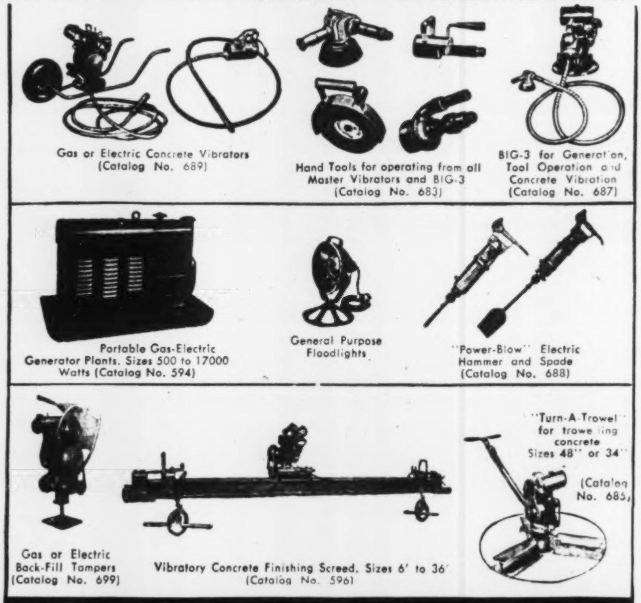
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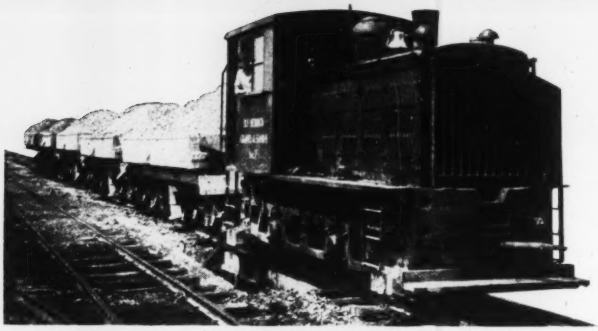


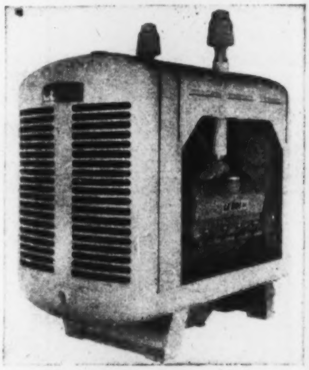
Over a period of many years, under all kinds of operating conditions, PLYMOUTH Locomotives have established proved records of dependable performance. Economical to use and economical to maintain, PLYMOUTH Locomotives are built well—and built right—by careful engineering planned to meet exacting requirements in the construction field. We feel sure there's a PLYMOUTH Locomotive to meet your particular needs. Write for complete details today.

FOR COMPLETE DETAILS WRITE TODAY

PLYMOUTH LOCOMOTIVE WORKS

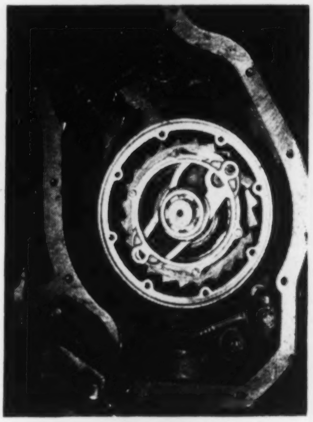
DEPT. A-4 PLYMOUTH, OHIO

heaters and the plastic-encased coil.—The Trumbull Electric Mfg. Co., Plainville, Conn.



New V-8 Engine

Valve-in-head unit rated up to 135 hp. runs on gasoline, butane, or natural gas. Compact, easily accessible, and light in weight. Has aluminum pistons and push-button electric starting.—Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis.

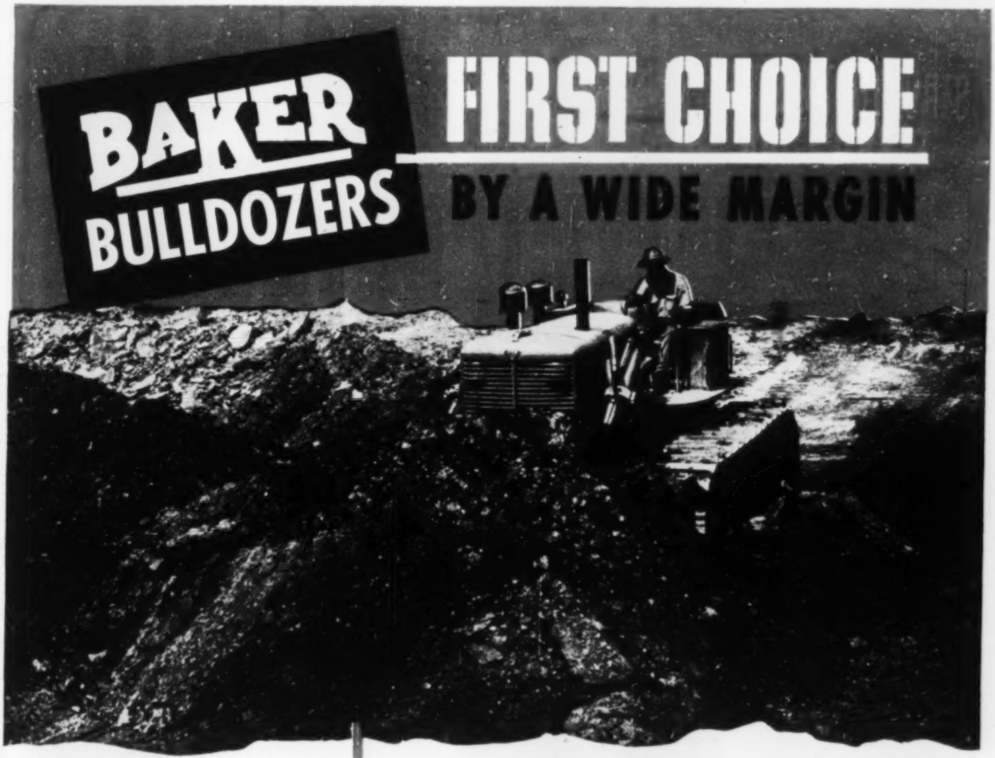


Automatic Brake

An automatic brake is now available as optional equipment for the Hyster D6N Towing Winch. The brake lever is set before winching so that when the drum stops winding, the brake automatically engages, thereby holding the load in place. Since the single pawl or dog carried by the revolving arm, is retractable, it does not click against the ratchet teeth in the rim.—Hyster Co., Portland, Ore.

Aluminum Soil Pipe

As there is said to be a shortage in soil pipe and fittings, it is of interest that this manufacturer of aluminum soil pipe offers immediate delivery. It is especially recommended for all above-ground plumbing installations.



A Few Recent Purchasers of One or More Baker Dozers and A-C HD-19 Tractors

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Coal Mining — Boonville, Ind.
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Utility — Dayton, Ohio
WYANDOTTE CHEMICALS CORP.
Quarry — Alpena, Mich.
LONE STAR CEMENT CO.
Cement — Bonner Springs, Kan.
CHILE EXPLORATION CO.
Mining — New York, N. Y.
SMITH CONTRACTING CORP.
Contractor — Ft. Worth, Texas
ROBINSON CLAY PROD. CO.
Quarry — Akron, Ohio
HYDRO-ELECTRIC POWER COM'N.
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CANADIAN INTERNATIONAL PAPER CO.
Logging — Montreal, Can.
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The Baker Bulldozer and HD-19 Allis-Chalmers tractor combination has really rocked the industry — amazed even the most experienced earth-movers with its power, traction and speed — with its ability to move more yardage than any unit in its class.

The Baker Hydraulic Bulldozer is perfectly matched in operating speed, balance and weight . . . important factors in getting the most out of the tractor. Its simplicity of design and operation mean faster bulldozing with less operator fatigue plus longer, trouble-free service.

Now, with buying again becoming selective, it is significant that from coast to coast — among contractors, quarries, mines, utilities and loggers — among experienced earth-movers who've tried them all, it's Baker Bulldozers by a wide margin. Before you buy any bulldozer, check with your Baker - Allis-Chalmers dealer.

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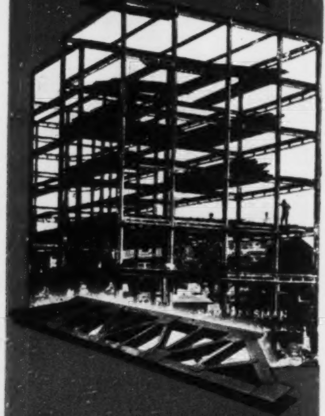
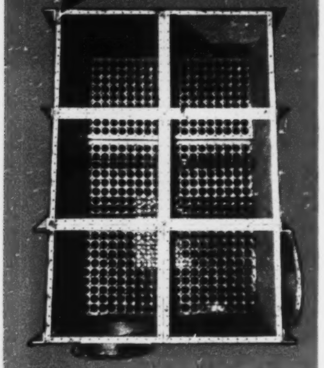


SPECIAL FABRICATION



We are prepared to furnish any type of fabrication in any metal to your particular specifications. Write . . .

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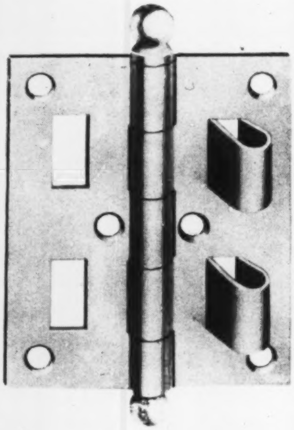
It is also used for venting, drainage, and sewage disposal systems.—General Aluminum Supply Corp., Rialto Bldg., Kansas City 6, Mo.



Self-latching Hinge

A device that adds to any conventional butt-hinge the function of a latch spring, has been introduced. It is not only self-latching, but is also self-aligning. Both leaves of the hinge are slotted to permit the insertion of a "cam"-like design of a "U" shaped, tempered spring. One end of the spring is anchored in the door jamb. The other end, the curved, or "cam" side, compresses into the hinge slot. The spring then releases and latches by the manual closing of the door. It is installed like any other butt-hinge, except that a mortise, the depth of the spring insert, must be provided. No other separate latch, catch, or hook need be put on. With the addition of a knob or handle, the hanging of the entire door is complete.—Latchinge Corp., 9100 Rosellawn Ave., Detroit 4, Mich.

Power Wheelbarrow

The Moto-Bug can be equipped with an optional 4-ft. stake platform body that is easily interchanged with the 10-cu. ft. capacity. There is a hopper body; an optional riding step for the operator, and a dual wheel has been placed on the direct steering mechanism. Better all-around performance is claimed as a result of these changes. Adding the flatbed platform gives the machine a 1,200-lb. capacity for truck handling loose loads, skids and bins. Also, the platform body may be tilted for unloading certain kinds of heavy material.—Kwik-Mix Co., Port Washington, Wis.

RUD-O-MATIC TAGLINE

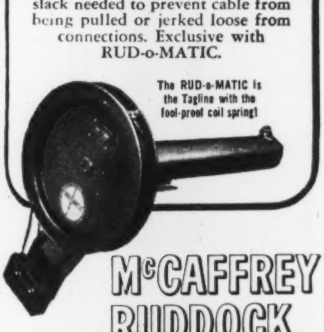
Provides positive, steady tension — holds buckets steady under all working conditions.

Spring tension holds buckets steady. No weights, pins, tracks, or carriages. Cable saving more than pays for RUD-o-MATIC. Compact—easily installed. Eight models to fit all bucket sizes.

RUD-o-MATIC Taglines are used as standard equipment by most crane manufacturers. Spring tension is powerful enough to hold a clam shell bucket steady. Operates with boom at any angle. Compact – it can be installed in less than thirty minutes. No pins, weights, tracks, or carriages to wear or be replaced. Taglines are complete with fairlead U bolt clamping plates, and cable attached. Immediate delivery – see your equipment dealer – or write –

- *Dealers—selected territories in Midwest and Northwest are still open. Write for all details.*

RUD-o-MATIC combination Magnet Reel and Tagline . . . operates on spring tension principle with tagline attached to magnet to steady – and electric cable fastened to magnet connections with all slack needed to prevent cable from being pulled or jerked loose from connections. Exclusive with RUD-o-MATIC.



The RUD-o-MATIC is the Tagline with the fool-proof coil spring!

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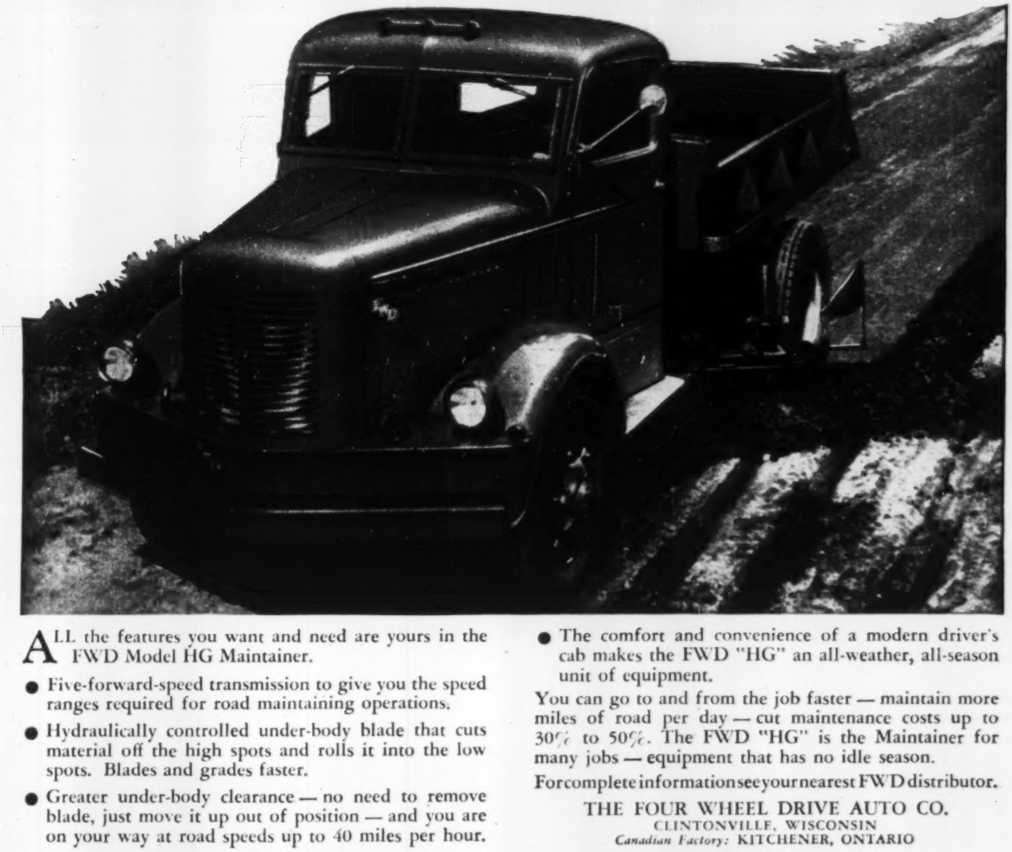
MILES AHEAD IN FAST LOW-COST HIGHWAY MAINTENANCE!



ALL the features you want and need are yours in the FWD Model HG Maintainer.

- Five-forward-speed transmission to give you the speed ranges required for road maintaining operations.
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- Greater under-body clearance — no need to remove blade, just move it up out of position — and you are on your way at road speeds up to 40 miles per hour.
- The comfort and convenience of a modern driver's cab makes the FWD "HG" an all-weather, all-season unit of equipment.

You can go to and from the job faster — maintain more miles of road per day — cut maintenance costs up to 30% to 50%. The FWD "HG" is the Maintainer for many jobs — equipment that has no idle season.

For complete information see your nearest FWD distributor.

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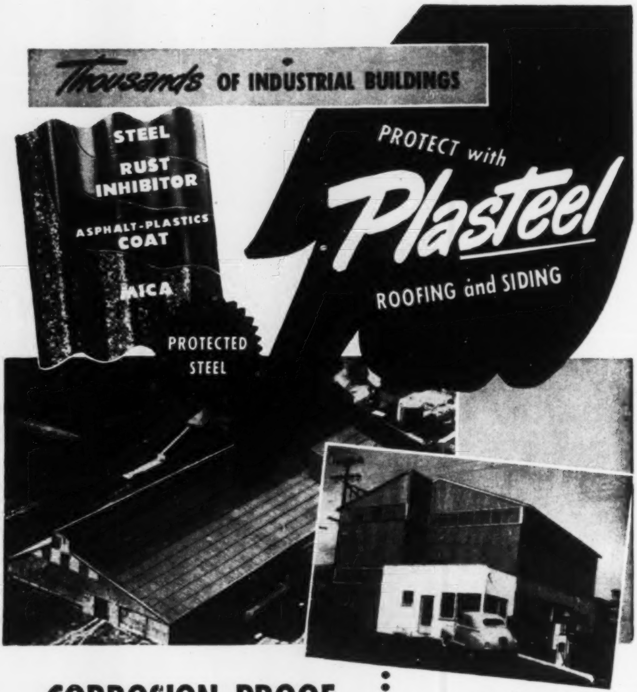

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resists acid fumes, smoke, gases, alkalies, heat, cold, moisture, etc.

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Manufacturers' Publications

Steel Rolling Scaffolds – Circular says Tube-Lox rolling scaffolds are simple in design and have only four basic parts. They may be erected for any type of overhead work, 6 ft. up to 60 ft. or higher. They are designed for maximum safety, mounted on free-rolling casters, they may be rolled as the job progresses, while brakes on the casters hold the scaffold firmly in place during work. — THE PATENT SCAFFOLDING CO. INC., 3821 TWELFTH ST., LONG ISLAND CITY, N. Y.

Hoisting Equipment – A handy pocket-size catalog describes gasoline, electric, belt and steam hoists, car pullers, timber derricks, steel derricks, deck machinery, whirleys, hand power, builders' towers, rollers and logging machinery. — CLYDE IRON WORKS, INC., DULUTH 1, MINN.

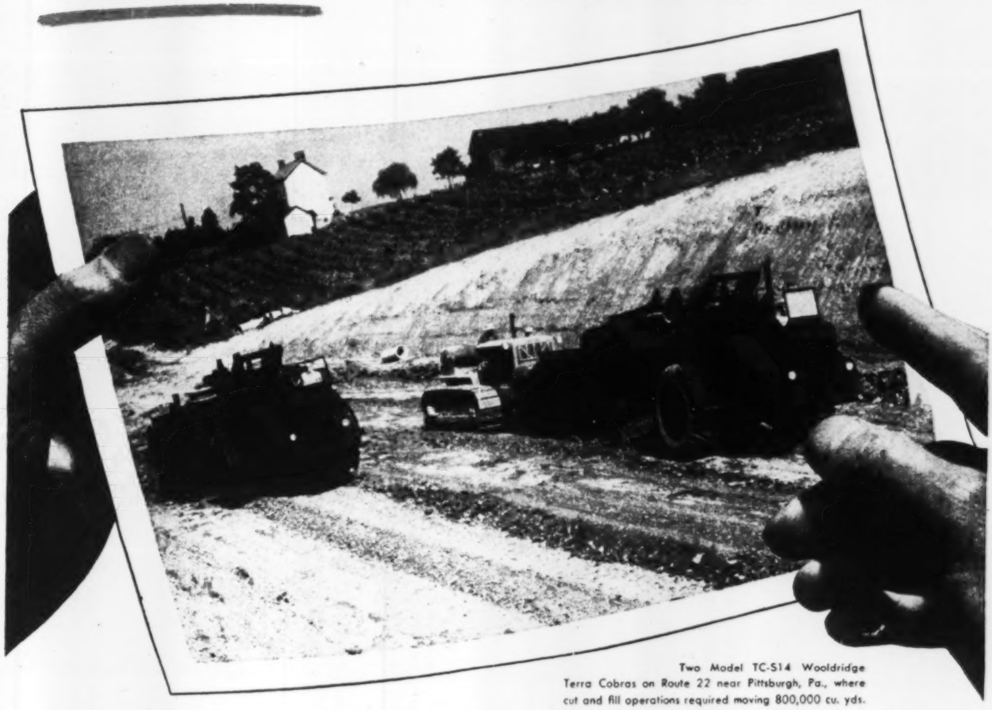
Switchboardless Generators – A 2-page catalog tells about the Katolight "AC" generator, 175 kw; 60 cycles, 3 phase, 900 rpm. eight pole, 480/830/-960/1660 volt, with overhead belted exciter, complete with panel including automatic voltage regulator, voltmeter, ammeter, and exciter field rheostat. Generators of these capacities usually require a separate switchboard. The engineers have attempted to so arrange these machines that in many cases a separate switchboard is not necessary. The automatic voltage regulator and the necessary meters are enclosed in a separate cabinet mounted on top of the outlet cabinet, and the sensitive meters and regulators are isolated from mechanical vibration by special rubber vibration dampers.—KATO ENGINEERING CO., MANKATO, MINN.

Lighting Equipment–A pocket-size catalog contains full information about fluorescent and incandescent lighting equipment. Among new products is a recessed troffer with a jackknife hinge that lowers lamps, starters, louvres and reflectors for easy cleaning and servicing.—EDWIN F. GUTH CO., 2615 WASHINGTON AVE., ST. LOUIS 3, MO.

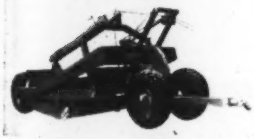
Short Circuit Protection–Vol. I, No. 23 of the Accelerator, describes EC&M Valimitor motor starters suitable for use with 2300-4600 motors on a power circuit of any capacity.—THE ELECTRIC CONTROLLER & MFG. CO., CLEVELAND 4, OHIO.

(Continued on page 230)

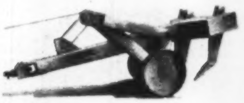
TERRA COBRAS PAY OFF ON 4500-FOOT HAUL!



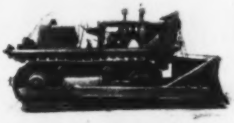
Two Model TC-S14 Wooldridge Terra Cobras on Route 22 near Pittsburgh, Pa., where cut and fill operations required moving 800,000 cu. yds.



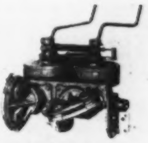
SCRAPERS: Boiling Bowl and Terra Clipper Scrapers from 7.5 to 27.5 cu. yd. heaped capacities.



RIPPERS: Three models: for extra heavy, standard, or light duty.



BULLDOZERS and Trailbuilders for all standard makes of tractors.



POWER CONTROL UNITS: Two-drum winches for use with all standard tractors.

On long or short hauls, Terra Cobra's quick loading, high haul speeds, and fast spreading or dumping pay off in higher profits. These powerful 200 hp Wooldridge self-propelled earthmovers have proved their ability to handle greater yardage at lower cost per yard. "Easy on the operator," states the shift boss. That means more profit, too, with less slow-downs from operator fatigue. Due to positive two-wheel steering, powerful rear-wheel brakes, and many other proved Wooldridge features, higher speed operation is maintained throughout each shift with maximum safety.

Before you figure that next job, contact your nearest Wooldridge Distributor for complete details on the Terra Cobra. Prompt delivery is assured by placing your orders early.

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Sunnyvale, California, U.S.A.

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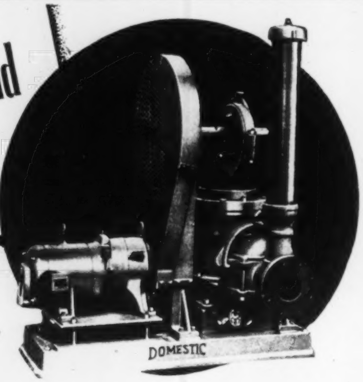
PROVED AND APPROVED FOR EVERY TYPE OF EARTH-MOVING JOB

Self-loading Dirtmover — Information on the new D Roadster Tournapull, one-man operated, self-loading dirtmover, is contained in a broadside which carries specifications on this new 9-ton tool, and lists and illustrates features which make it profitable on a wide variety of jobs. These include its positive-ejection scraper, travel speeds up to 25 m.p.h., all-weather torque-proportioning differential, 2-speed positive power steer, electric control and 4-wheel air brakes. — R. G. LeTourneau, Inc., Peoria, Ill.

Truck Size and Weight Restrictions —In compiling the 1949 edition of "Truck and Trailer Size and Weight Restrictions," the publishers got state officials to check and approve the statements concerning the laws now in force in their respective states. The booklet covers the laws of every state, devoting one page to each width, height, length of single unit, tractor semi-trailer and other combinations, minimum axle spacing, weight restrictions per axle or per wheel are given, together with special laws governing sizes and weight of truck and truck-trailer combinations. — The Four Wheel Drive Auto Co., Clintonville, Wis.

Expansion Joint Remover—A circular tells about the Willits rotary ex-



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Our 44 years of engineering and manufacturing experience assure superior construction and service.

DOMESTIC plunger sludge pumps are today performing herculean tasks in every state in the Union, many after decades of gruelling use.

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pansion joint remover which provides a fast, sure method of removing old asphalt expansion joints on streets, highways and airports. Its average speed is about 1,500 lin. ft. per hour. —San Jose Pipe & Tank Co., 1596 West San Carlos St., San Jose, Calif.

Bronze Mouldings – An interesting folder describes bronze mouldings for permanence, safety and beauty in such structures as schools, hospitals, theaters, recreational buildings, hotels, auditoriums, office buildings, naval construction, institutions, factories and government buildings. — The Loxit Moulding Co., 1217 W. Washington Blvd., Chicago, Ill.

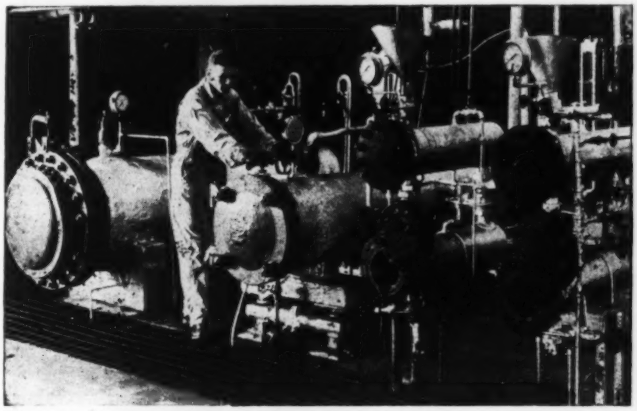
Motor Grader–A new catalog points out the special features of the No. 610 diesel-powered motor grader of 100 hp., and weighing from 25,200 to 27,000 lb. It has combination mechanical-hydraulic steering, full-floating rear axle, 8 forward speeds with a high transport speed of over 25 m.p.h., 14:00-24 rear tires on tandem, 12-ft. blade 28 in. wide and new, improved, faster mechanically-operated controls. —J. D. Adams Mfg. Co., Indianapolis, Ind.

Insulation Adhesives–There is a reference manual on sealers, surface coatings, cements, mastics, emulsions and other adhesives for use with various types of insulation. This 16-page manual gives a detailed discussion of the basic properties and uses—viscosity, coverage, flammability, heat flow and resistance to acids and alkalis. Also included is a reference chart which summarizes bonding and drying times, colors, temperature limits, types of thinner and pertinent application data for each type of adhesive material.—Benjamin Foster Co., 4623 W. Girard Ave., Philadelphia 31, Pa.

Water Equivalents — A handy pocket-size booklet contains quick reference charts for converting water measurements from one set of terms to another. It gives approximate figures for weight, power and volume; rate of flow; and velocity in different pipes. It is of value to all in the water works field.—R. W. Sparling, 101 Park Ave., New York, N. Y.

Concrete Admixture—Folder describes "Portite," which when used in the ratio of 4 oz. per bag of cement is said to be a controllable air-entraining agent, a wetting or dispersing agent and a promoter of cement hydration. The manufacturer claims it will improve concrete, cement plaster and mortar because it reduces the water re-

These experimental wood-treating cylinders vary in size from 2" x 12" to 4' x 20'. It is possible to make detailed studies ranging from test-tube quantities to semi-commercial quantities.



HOW KOPPERS FAMOUS TECHNICAL LABORATORY

helps improve serviceability of wood

The Koppers Technical Laboratory at Orrville, Ohio is one of the most complete wood-treating laboratories in the world. Here, Koppers experts, working with the best in modern equipment, lead the field in the development of improved wood-preservatives and techniques.

In addition to other research, the staff of this laboratory is constantly working on the following projects: a continuing study of pressure-treatment with creosote; the evaluation of all known treating materials; the development of new preservatives.

▸▸ How Koppers technical facilities can help you!

This famous Koppers Technical Laboratory is now equipped to handle your specific wood-treating problems. Its technical staff welcomes your inquiries, and will gladly recommend the *proper* technique of treatment . . . the *proper* type of preservative to meet your individual needs. Write for further information.

KOPPERS PRESSURE-TREATED WOOD

KOPPERS COMPANY, INC., Pittsburgh 19, Pa.

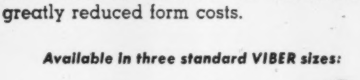
Reduce
Form Damage
with
NEW VIBER
RUBBER TIPPED
VIBRATORS
ELECTRIC
PNEUMATIC
GASOLINE

Viber Company has long recognized the destructiveness of steel vibrators on many popular form lining materials.

Realizing that damage to Celotex, plaster of Paris inserts for architectural concrete and plywood is expensive, they studied the possibility of using RUBBER TIPPED VIBRATORS.

After critical tests on many large concrete construction jobs, it was found that the new VIBER RUBBER TIPPED VIBRATORS greatly reduced form costs.

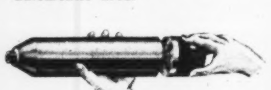
Available in three standard VIBER sizes:



For additional information please write or wire:

VIBER CO
CONCRETE VIBRATORS
EST. 1931 Dept. 20 726 South Flower Street · Burbank, California

Made of high quality live rubber, Viber's Rubber Tipped Vibrators are built to withstand extreme punishment (the same rubber used to make automobile tires)



New style housing with replaceable rubber tips may be used in place of one-piece steel housing. Rubber tips are easily replaced. Simply unscrew worn part and install new tip.

VIBER RUBBER TIPPED VIBRATORS MINIMIZE GRINDING AND GREATLY REDUCE FORM FACE DAMAGE AND FORM REPLACEMENT.

quirement, eliminates segregation, improves workability at low slump, reduces bleeding, increases bond to steel, reduces shrinkage, resists freeze-thaw effects, increases compressive strength, provides waterproofness, reduces finishing time, allows earlier removal of forms, prevents honeycombing and increases yield.—HOPPER PRODUCTS, INC., 12 E. 41ST ST., NEW YORK.

Motor Trucks—(20-p. folder) Describes special features in broad line of trucks and gives specifications and applications for each unit. Outlines complete information on both gasoline and diesel-powered units of both conventional and six-wheeler design.—FEDERAL MOTOR TRUCK CO., 5780 FEDERAL AVE., DETROIT 9, MICH.

Drilling Machines—Sibley Models D-24 and D-28 drilling machines are illustrated and described in a new catalog. The two-color bulletin lists the improved features. Accented is the increased operator efficiency gained by the Model D's V-belt drive direct from the motor to a 4-speed geared transmission; an "inching" button at the front of the machine which provides ease in changing speeds; and the handy 4-speed geared transmission lever.—SIBLEY MACHINE & FOUNDRY CORP., SOUTH BEND 23, IND.

Clearing Methods—Clearing methods for construction sites, mine and quarry operations, housing projects, and applications in the export field are featured in the new Caterpillar 15-page illustrated booklet "Clearing for Action." — CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Fan-cooled Motors—Nine outstanding features of totally-enclosed fan-cooled motors with tube-type air-to-air heat exchangers are described in a new bulletin. It is claimed that the problem of removing heat losses without exposing electrical parts to harmful atmospheric conditions has been solved in these motors, available in squirrel cage, wound rotor and synchronous types, for vertical or horizontal installation. Ratings range from 150 hp. at 1,200 rpm. to several thousand horsepower, at standard speeds of from 3,600 rpm. to about 300 rpm.—ALLIS-CHALMERS MFG. CO., MILWAUKEE, WISC.

Snow Removal—The battle of highway crews night and day against severe weather conditions and the "pre-season" work conducted in improving the speedy operation of snow removal is shown in a current 11-page booklet "Beating Back the Blizzards." Other

(Continued on page 235)

Barber-Greene

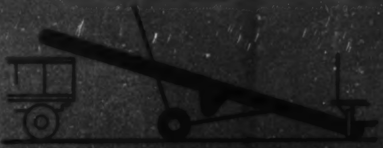
All-Material
All-Job
PORTABLE CONVEYORS

847461

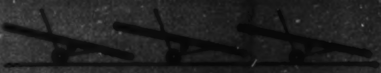
Faster..Lowest Cost per Ton..
One-Man Operation

The versatility and one-man usefulness of B-G Portable Belt Conveyors offer almost unlimited possibilities for cutting the cost per ton handled — speeding up loading, unloading, stockpiling and conveying operations wherever they're put to work. These modern high-capacity conveyors handle all materials—stone, sand, gravel, coal, coke, ashes, bulk chemicals, bagged or boxed material — even wet concrete. Available in many sizes (lengths from 25′ to 60′; belt widths from 18″ to 30″) with advanced features that include highly portable, pneumatic-tired wheel trucks, lighter, stronger frames, V-belt drives and speed reducers—no chains or sprockets—and 100% anti-friction bearings. Use the coupon or see your B-G distributor for full information. Barber-Greene Company, Aurora, Illinois.

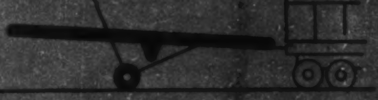
101



Unloading-loading cars, trucks



Multiple setups for unloading-loading, conveying bulk or packaged material.



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New Literature Describes New Advantages of the B-G Portable Conveyors

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☐ Have distributor get in touch with me.

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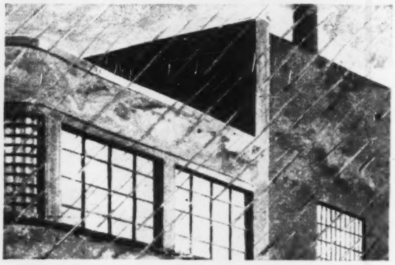
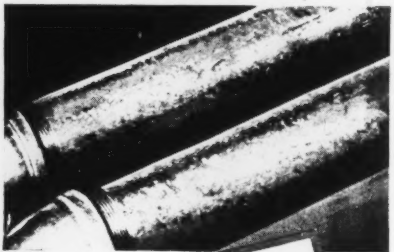
LAPIDOLITH-treated floors last where heavy traffic and trucking break down untreated concrete or terrazzo. Makes traffic surface literally hard as granite. Exclusive, penetrating agent carries hardening agent deep into concrete. Application is easy as mopping the floor.



WATERPROOFING AND DAMPPROOFING

HYDROCIDE for excluding water above or below ground, inside or out. There's a Hydrocide for every problem... from a transparent, colorless film that protects masonry walls from rain penetration... to a one-coat mastic as efficient as the conventional 5-ply membrane system.



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S. R. P. penetrates the scale and bonds to sound metal...stops rust. Better resistance to weather and brine than red lead. Non-toxic. Not affected by fumes or ordinary industrial concentrations of most chemicals. Can be safely used in temperatures as high as 250°F. Available in colors.

If you have a tough problem in any of these three fields, call in your Sonneborn Man. Chances are, he has the answers, or can get them for you. If you don't have his name, write us your problem direct.

L. SONNEBORN SONS, INC.
BUILDING PRODUCTS DIVISION
80 EIGHTH AVENUE, NEW YORK 11, N. Y.

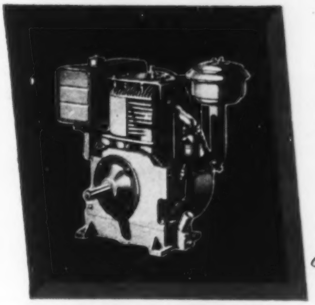
recent Caterpillar booklets deal with building and maintaining with diesel motor graders and keeping on schedule with off-track equipment.—Caterpillar Tractor Co., Peoria 8, Ill.

Corrugated Metal Pipe—The advantages of flexible paved corrugated metal pipe in resisting corrosion, erosion, shearing and other damage is described in technical terms with typical applications and engineering data in a new 4-page illustrated bulletin issued by—United Steel Fabricators, Inc., Wooster, Ohio.

Batching Plants – Three types of batching plants are described in a bulletin which has just come off the press. Included are all recent improvements in central mix, transit mix and concrete products plants and accessory equipment. Data, specifications and illustrations are arranged for easy interpretation and to present useful ideas to operators. The plants range in capacity from 100 to 400 tons and in most cases are combination plants with both aggregate and cement compartments.—Heltzel Steel Form and Iron Co., Warren, Ohio.

Self-priming Pumps—A new type of self-lubricated shaft seal, which is entirely enclosed in a welded, pressed steel cartridge, is a feature of the 7M and 10M models of self-priming centrifugal pumps described in a bulletin. This entire unit may be easily replaced if necessary, thereby eliminating much of the cost and labor formerly required to replace such seals. Other features include: Fully automatic priming after the pump is once put into service; direct line flow of water or other liquid through suction opening to impeller; built-in suction check valve, which holds liquid in pump for re-priming and which eliminates the need for a foot valve in the hose; non-clogging impeller and wear plate, both of which are easily replaceable if wear occurs.—Rice Pump & Machine Co., Milwaukee 4, Wis.

Handbook of "U" Values—Builders and contractors interested in providing good insulation for buildings of all kinds will value a new handbook of insulation values issued by this manufacturer of reflective insulation materials. The 108-page book lists 12,852 certified, F.H.A.—approved "U" values of various walls, floors and ceilings. It includes both summer and winter insulation values. The book, regularly priced at $1. a copy, is available free to qualified personnel in engineering, architecture, buildings, etc.—Silvercote Products, Inc., 161 E. Erie St., Chicago 11, Ill.



Get America's No. 1 Power Value Briggs & Stratton

You get *greater value*, dollar for dollar, when your equipment is powered by Briggs & Stratton 4-cycle, single-cylinder, air-cooled gasoline engines!

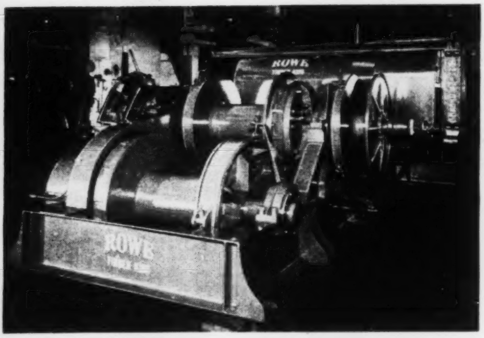
No. 1 in design, workmanship, and materials. No. 1 in performance, economy, and durability. No. 1 in quality and availability of service. That's why Briggs & Stratton powered equipment gives better service and greater satisfaction.

These sturdy, compact engines are No. 1 with manufacturers, dealers, and users alike because they know that these precision-built engines run smoother, last longer, with less operating cost. Specify America's preferred power — Briggs & Stratton — for *your* gasoline engine power requirements.

BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U. S. A.

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES
World Wide FACTORY SUPERVISED SERVICE

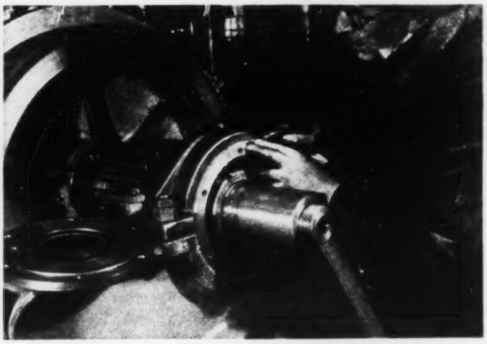
Torrington Spherical Roller Bearings Stand Up to Shock and Deflection In Rowe Timber King Yarders



For handling heavy materials like logs, beams and pipe, Timber King Yarders have to be rugged. To back up a 32-ton line pull, and make sure each Yarder will stand up to hard usage and severe shock, Rowe Machine Works uses 6 Torrington Spherical Roller Bearings on main, haulback and strawline drums.

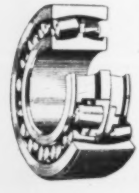
These precision bearings give the low torque that means easy starting under heavy loads, smooth running with low power consumption. When shock loads deflect drum shafts or distort yarder frames, Spherical Roller Bearings compensate automatically for misalignment, keep rolling effortlessly.

Easy handling and installation of Spherical Roller Bearings, due to their unit design, is appreciated both in assembly and servicing. Readily accessible, the bearings, reduce down time in the field. Were it necessary, two men could easily dismount and remount all six bearings in a day.



Welded construction of yarder frames would make it difficult to secure accurate alignment with rigid bearings. Spherical Roller Bearings make proper initial and running alignment a matter of course. Time is saved in assembly. Long service life is assured under the most severe operating conditions.

In equipment you build or operate, specify Torrington Spherical Roller Bearings for long service life and minimum maintenance attention. Our engineers offer their experience to help you with your friction problems. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind. or Torrington, Conn. District offices and distributors in principal cities.



TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller · Tapered Roller · Straight Roller · Needle · Ball · Needle Rollers

Locomotive Crane—A new catalog on 25 ton diesel locomotive crane is available. It illustrates the crane in action in magnet, bucket, hook and pulp woodwork. Man photographs of the important mechanical features are included.—AMERICAN HOIST & DERRICK CO., ST. PAUL 1, MINN.

Diesel Engines—(24-p. booklet) Design features, specifications and work capacities of six International diesel engines from 39 to 180 hp. Illustrations show engines stripped and performance charts reveal intermittent and continuous horsepower and average fuel consumption with wide-open throttle under intermittent load. Table provides lifting of engine capacities in operating rock crushers, generators, hoists, sawmills and pumps. All-weather starting system is explained. There is also a section on the fuel system.—INTERNATIONAL HARVESTER CO., 180 NO. MICHIGAN AVE., CHICAGO 1, ILL.

Safety Ladder Stage—(2-p. folder) Describes safety ladder stage to provide working area or scaffolding unit for all above-ground operations where ladders can be used. Affords a working area of 26x24 in. with frame fabricated of aluminum alloy, stage weighs less than 9 lb. Foot boards are of seasoned waterproof wood and are slotted for easy width adjustment.—JUANIATA CO., HUNTINGDON, PA.

Dumptors—(28-p. booklet) Titled "Cutting Haul Costs with Koehring Dumptors", this publication deals with off-road material hauling, with time study results, production charts and specifications. Mechanical features of equipment are outlined and described in detail. Dumptor has capacity of 5¼ cu.yd. struck measure and payload weight of 15,600 lb. Traveling speeds range from 5.37 to 18.94 mph. —KOEHRING CO., 3026 WEST CONCORDIA AVE., MILWAUKEE 10, WISCONSIN.

Rotary Positive Blowers—A 20-page bulletin, printed in two colors, opens with a foreword outlining some of the principal uses for rotary positive blowers. Operating advantages and principles are discussed, accompanied by several performance curves under various operating conditions. Separate pages are devoted to the four standard types of blowers as now being offered, showing complete views and cross-sections of each, with condensed specifications covering the four types.—ROOTS-CONNERSVILLE BLOWER CORP., 900 W. MOUNT ST., CONNERSVILLE, IND.

"INFERNO"

Stronger, Tougher, Safer Than Ever

GOODALL RUBBER CO. INC.
G
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C
INC.
INFERNO STEAM

FOR CONTINUOUS SERVICE UP TO 200 lbs.—400°F.

Since it was first designed, for the earliest steam hose applications, "Inferno" has been improved to meet progressively higher requirements. Today, it represents the ultimate in steam hose construction—a masterpiece of quality craftsmanship insuring unequalled strength, durability and safety.

Flexible steel sinews have been added to the carcass. A tough, red cover provides greater resistance to abrasive wear and all kinds of weather. The tube is made from the most efficient rubber compound ever developed for steam.

A Goodall "Standard of Quality" product, for pile driving and all other heavy-duty steam jobs, at pressures up to 200 lbs. and steam temperatures to 400° F. Made in sizes ½" to 2", I.D., in maximum lengths of 50 feet.

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Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • St. Paul • Los Angeles
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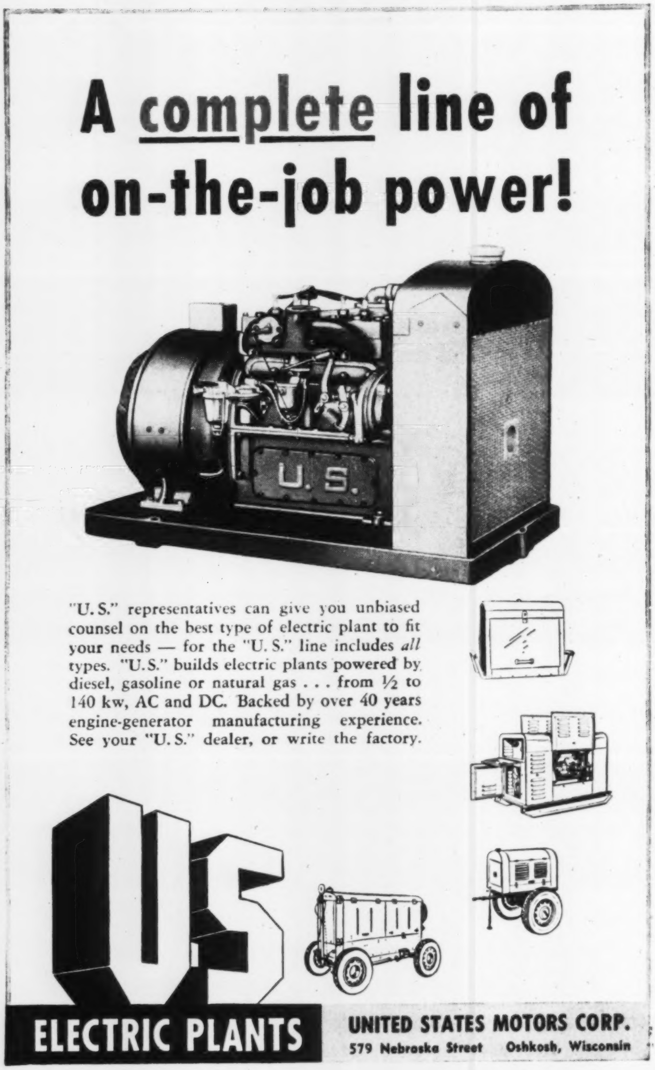
A complete line of on-the-job power!

"U. S." representatives can give you unbiased counsel on the best type of electric plant to fit your needs — for the "U. S." line includes *all* types. "U. S." builds electric plants powered by diesel, gasoline or natural gas . . . from ½ to 140 kw, AC and DC. Backed by over 40 years engine-generator manufacturing experience. See your "U. S." dealer, or write the factory.

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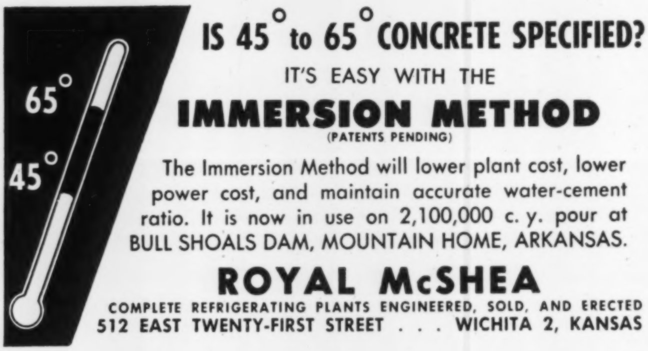

IS 45° to 65° CONCRETE SPECIFIED?
IT'S EASY WITH THE
IMMERSION METHOD
(PATENTS PENDING)

The Immersion Method will lower plant cost, lower power cost, and maintain accurate water-cement ratio. It is now in use on 2,100,000 c. y. pour at BULL SHOALS DAM, MOUNTAIN HOME, ARKANSAS.

ROYAL McSHEA
COMPLETE REFRIGERATING PLANTS ENGINEERED, SOLD, AND ERECTED
512 EAST TWENTY-FIRST STREET . . . WICHITA 2, KANSAS

Manufacturers' Activities

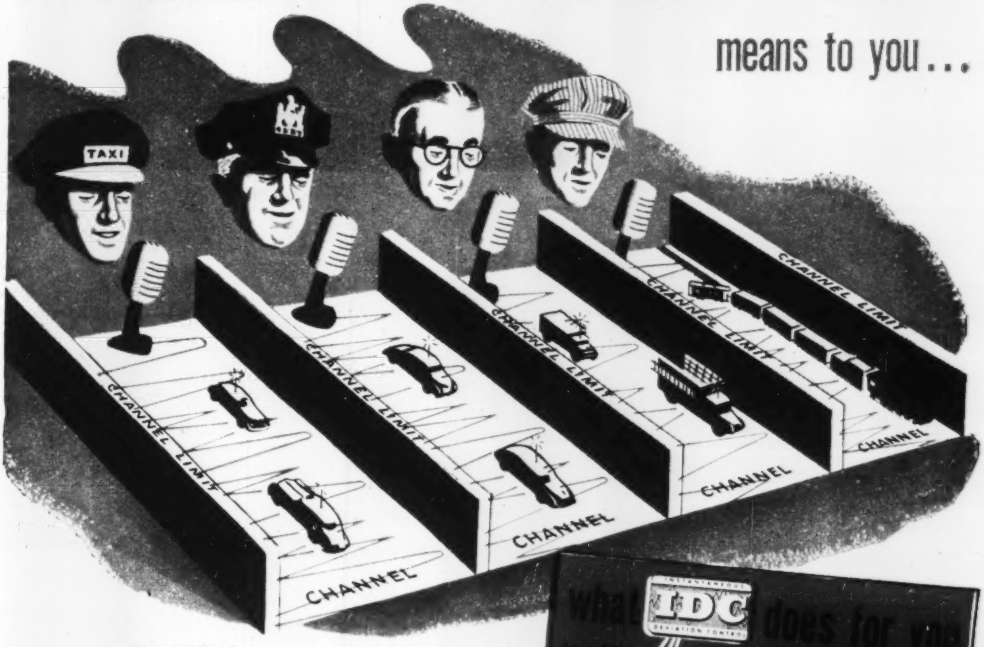
Sales—A. H. Tetrick is sales manager of the construction machinery division of Southwest Welding & Mfg. Co. . . . A. S. Rubin, Jr., is sales manager for Marlow Pumps, Ridgewood, N. J. . . . Philadelphia branch sales office of Syntron Co. has moved to larger quarters at 1018-20 West Lehigh Ave., Philadelphia 33, Pa. . . . Jas. V. Wilcox and J. C. McGuire are sales and service representatives of Kennametal, Inc. of Latrobe, Pa., at Provo, Utah and Eastbank, W. Va., respectively . . . R. F. Garity has been appointed eastern industrial territory manager of the Allis-Chalmers Tractor Division . . . Rodney Fox has joined the sales staff of FWD, Clintonville, Wis.

T. F. Rose has become manager of Timken Roller Bearing Service and Sales, Ltd., at Toronto, Ont. . . . Hyster Co. has named F. W. Vigneautt, Jr., as district representative for tractor equipment in the northeastern territory . . . Homer L. Knouse is southern sales representative for the construction machinery division of the Chain Belt Co. of Milwaukee . . . Penn Metal Co. Inc., has appointed A. D. Goodson, Jr., as its district sales manager for the Texas territory at 3802 Ruth St., Houston . . . A. W. McGraw has been added to the road machinery sales staff of the W. A. Riddell Corp., Bucyrus, Ohio . . . K. H. Brunt is industrial sales representative and W. E. Knox industrial sales engineer for the California division of the International Derrick & Equipment Co. of Columbus, Ohio, at Torrance, Calif. . . . I. N. Kimsey is field sales manager of the industrial products sales department of The B. F. Goodrich Co., and H. F. Mosher is manager of the Dallas, Tex., district . . . L. P. Oelschlager is assistant sales manager of the gasoline hammer division of Barco Mfg. Co., Chicago . . . Marvin Wall is sales engineer for the heavy machinery division of Nordberg Mfg. Co. in the southwest territory at Cotton Exchange, Dallas.

Distributors—McCall-Boykin Co., Inc., Calvert & 20th Sts., Baltimore, Md., is new distributor of Hyster lift truck, straddle trucks and mobile cranes in the vicinity of Baltimore . . . Chase Parker & Co., Inc., are distributors in the Boston, Mass., area for Diamond Chain Co., Inc., Indian-

(*Continued on page 242*)

what *Motorola's* "GOOD NEIGHBOR POLICY" means to you...



Motorola I.D.C. – Instantaneous Deviation Control

ANOTHER MILESTONE ALONG THE ROAD TOWARD ADJACENT CHANNEL OPERATIONS

Motorola Instantaneous Deviation control eliminates the severe nuisance interference that develops from channel "spill-over" by means of a new slope limiting device now an integral part of all currently manufactured Motorola transmitters. I.D.C., applied universally, will make close channel occupancy practicable. It is an *absolute solution*—not a conventional compressor amplifier or clipper-limiter compromise. Motorola's I.D.C. requires no "attack time," but controls carrier excursions instantly.

Motorola I.D.C. is available in kit form for all existing Motorola transmitters—mobile and base station. By installing I.D.C. in your transmitters—and urging your channel neighbors to reciprocate, you can enjoy new efficiency of communication.

what I.D.C. does for you

In addition to the "Golden Rule" benefits of [illegible] I.D.C. [illegible]

1. [illegible] the reduction of [illegible] range [illegible] energy level normally caused by [illegible] deviation.
2. [illegible] versatility in transmitter speech [illegible] setting of modulation level will allow satisfactory modulation by female or deep-voiced [illegible] dispatchers.
3. [illegible] freedom from background noise. (Mike [illegible] can be held close to lips as I.D.C. takes care of wide ranges of volume.)

NEW PROOF OF MOTOROLA'S LEADERSHIP!

[illegible] against Motorola I.D.C. today brings your equipment into compliance with FCC regulations [illegible] effect on July 1, 1950.

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Motorola

FM 2-WAY RADIO

MOTOROLA: *World leader in mobile 2-way radio communications*

Canadian Distributor: Rogers Majestic Ltd., Toronto - Montreal

Garrison Dam, under construction on the Missouri River near Garrison, North Dakota, will be the world's largest rolled-fill earth dam. When completed, the dam will be 210 feet high and over 2 miles long with a base width of nearly half a mile—a total fill of more than 70,000,000 cu. yds.

A load a

WITH GM

Euclid Bottom Dump, powered by GM Series 71 Diesel, dropping a load of fill dirt. Eight of these units, working with a BV Loader, hauled 631 such loads in a 10½ hour working day, an average of one load a minute. Haulage distance at this stage was about 500 yards.

ON the world's largest rolled-fill earth dam near Garrison, North Dakota, records for moving dirt are being smashed every day.

Bulk of the heavy equipment on the Garrison Dam project is powered by General Motors Series 71 Diesel engines. GM Diesels were selected for this job because–as the contractor puts it–"They can move dirt faster."

Reasons for this superior performance are obvious. GM Diesel engines are

Garrison Builders, Inc., operators of this equipment, are working on the 14 million yard stage-one contract on the west side of the river. Shown is a convoy of four Euclid Bottom Dumps approaching the embankment fill area.

minute...

DIESEL POWER

2-cycle—with power on every piston downstroke. They deliver a smooth, steady power output—twice as many power impulses for each revolution of the crankshaft. This added power-per-turn makes them more compact with more horsepower for their size than other type engines. They start instantly on their own fuel. Their simplified construction and clean design make maintenance much easier. Service problems are greatly simplified by the interchangeability of parts.

Add up these advantages and you'll see why General Motors Diesels are the first choice of construction men for any heavy-duty operation. Let us show you how these engines can bring greater efficiency and economy to your particular job. See your local equipment distributor or write direct to us.

GM
GENERAL MOTORS
DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES...*Up to 200 H.P.* DETROIT 28, MICHIGAN MULTIPLE UNITS...*Up to 800 H.P.*

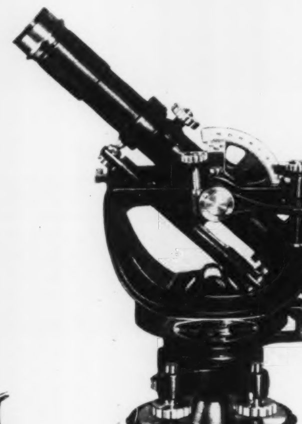
apolis, Ind., at 288-290 Congress St., Boston . . . Dan G. Cogwood, Jr., 272 Highland Ave., Newton, Mass., is exclusive representative in Maine, New Hampshire and part of Massachusetts for **George Haiss Mfg. Co., Inc.**, division of **Pettibone Mulliken Corp.**—conveyors, loaders, buckets, material handling equipment, crushers, asphalt plant and railroad equipment . . . Distributorship for **Clark Equipment Co.**'s fork lift trucks and industrial towing tractors has been granted to **Bond Industrial Equipment Co.**, 51 Clarkson St., New York . . . **Victor Equipment Co.**, San Francisco, Calif., is exclusive distributor for Nelson steel welding equipment and products in the Pacific coast area . . . **J. P. Waite, Inc.**, 3304 West Pierce St., Milwaukee, Wis., has been appointed to a full line dealership for **Davey Compressor Co.**, Kent, Ohio.

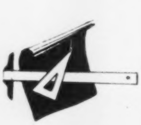
Personalities—H. S. Dershimer is a direct factory representative in Tulsa, Okla., for **Macwhyte Co.** of Kenosha, Wis. . . . Lloyd L. Bower is chief engineer of **Waukesha Motor Co.**, succeeding J. B. Fisher, retired . . . Dr. G. V. Slottman is director of research and engineering for **Air Reduction Co.** . . . Thos. J. Dale is superintendent of the main manufacturing plant of **Durisol, Inc.**, at Beacon, N. Y. Durisol is a new low-cost building material . . . Kempton Dunn is vice-president and Cyrus E. Brush secretary of the **American Brake Shoe Co.** . . . Louis R. Gaiennie is director of personnel of **Fairbanns, Morse & Co.**, at Beloit, Wis. . . . Malcolm D. Corner is commercial research manager for **American Bridge Co.** at Pittsburgh, Pa. . . . P. M. Hummer is manager of the Philadelphia district office of the **Armstrong Cork Co.** building materials division . . . Former Postmaster General James A. Farley is now president of the **General Builders Supply Corp.**, succeeding the late John P. Kane . . . New appointments by **SKF Industries, Inc.** are Stuart H. Smith, Cincinnati district manager; field representatives, C. N. Benson and D. B. Eden, Boston; A. R. Ehrnschwender, Cincinnati; J. T. Paradine, Atlanta, Ga.; and G. L. Hansen, Portland, Ore.

Deceased—John E. Urban, 81, retired purchasing agent of **Fairbanks, Morse & Co.**, died Feb. 7 . . . John H. Adams, 92, a pioneer in the development of the iron and steel industry in the Birmingham, Ala., district, died Feb. 10 . . . Harry W. Beedle, 69, former manager of the Boston branch, **The Electric Storage Battery Co.**, died Feb. 3 . . . Hugo L. Olson, 71, president of the **Sunderstrand Machine Tool Co.**, Rockford, Ill., died

Avoid
COSTLY ERRORS

Save Time and Money





You'll find

THE DAVID WHITE UNIVERSAL LEVEL-TRANSIT

IS THE MOST PRACTICAL ALL-AROUND CONTRACTOR'S INSTRUMENT YOU'VE EVER HANDLED

YES, you'll be time and money ahead if you use a David White Universal Level Transit in connection with all your survey and checking operations — your building and road construction. It is a low-cost, extremely accurate, amazingly rugged instrument. It quickly converts from level to transit. It's designed to provide maximum strength and protection to all parts — assuring you constant precision over long periods of use.

Among its many features are: Full 12" telescope with 25 power coated optics, a patented ball-bearing race, lock and release lever system, easy perfect alignment adjustments, guarded horizontal circle, vernier accurate to 5' vertical arc 3" diameter. Write today for complete information, price, etc., and the name of our nearest dealer.

We offer complete, prompt, repair service on all makes of instruments — levels, transits, theodolites, etc.

DAVID WHITE COMPANY

Manufacturers of
INSTRUMENTS FOR ENGINEERS, SURVEYORS AND BUILDERS
315 West Court St. • Milwaukee 12, Wis.

The Tanks are Elevated

NOT THE PRICES!

Posey Iron Has Its Own "INFLATION RESISTANCE" *Program!*

Posey Iron believes that there's no need to elevate prices on elevated tanks. Posey long ago adopted its own inflation resistance program . . . has never raised prices simply to follow the "trend". Instead, Posey engineers bear down to eliminate cost-padding frills and unnecessary steps of construction . . . overlook nothing that will permit estimates that are low *for workmanship of high integrity.*

Posey tanks are welded steel throughout . . . with no rivets where corrosion might gain a foothold. With interior surfaces as smooth and curved as those of a fine ball bearing, Posey Tanks are leak-free . . . corrosion resistant.

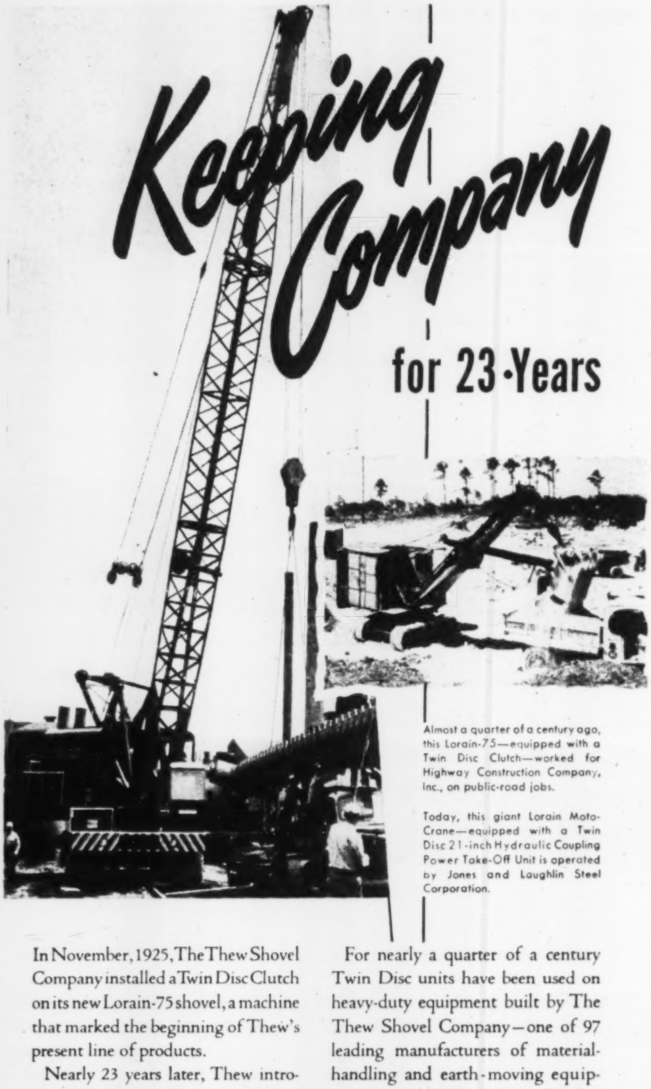
Let us know your conditions and we may be able to show you how Posey elevated storage tanks can increase capacity . . . aid production . . . reduce maintenance . . . and perhaps eliminate expensive equipment. Write today. No obligation.

POSEY IRON WORKS, INC.

***formerly* LANCASTER IRON WORKS, INC.**

LANCASTER, PA., U.S.A.

- TANKS
- WROUGHT IRON, STEEL AND ALLOY STEEL PIPE
- O. D. PIPE
- TEES
- ELBOWS
- AUTOCLAVES
- STEEL PLATE CONSTRUCTION



Almost a quarter of a century ago, this Lorain-75—equipped with a Twin Disc Clutch—worked for Highway Construction Company, Inc., on public-road jobs.

Today, this giant Lorain Moto-Crane—equipped with a Twin Disc 21-inch Hydraulic Coupling Power Take-Off Unit is operated by Jones and Laughlin Steel Corporation.

In November, 1925, The Thew Shovel Company installed a Twin Disc Clutch on its new Lorain-75 shovel, a machine that marked the beginning of Thew's present line of products.

Nearly 23 years later, Thew introduced a rubber-tired, two-engine Lorain Moto-Crane, equipped with a Twin Disc Hydraulic Power Take-off. Moto-Crane, said to be the world's largest, weighs 65 tons and has a capacity of 45 tons at a 12-foot radius.

For nearly a quarter of a century Twin Disc units have been used on heavy-duty equipment built by The Thew Shovel Company—one of 97 leading manufacturers of material-handling and earth-moving equipment who find Twin Disc Clutches and Hydraulic Drives efficient units for power transmission. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Feb. 1 . . . Fred D. Wood, 70, founder of the KENTUCKY ROCK ASPHALT Co., died Jan. 21.

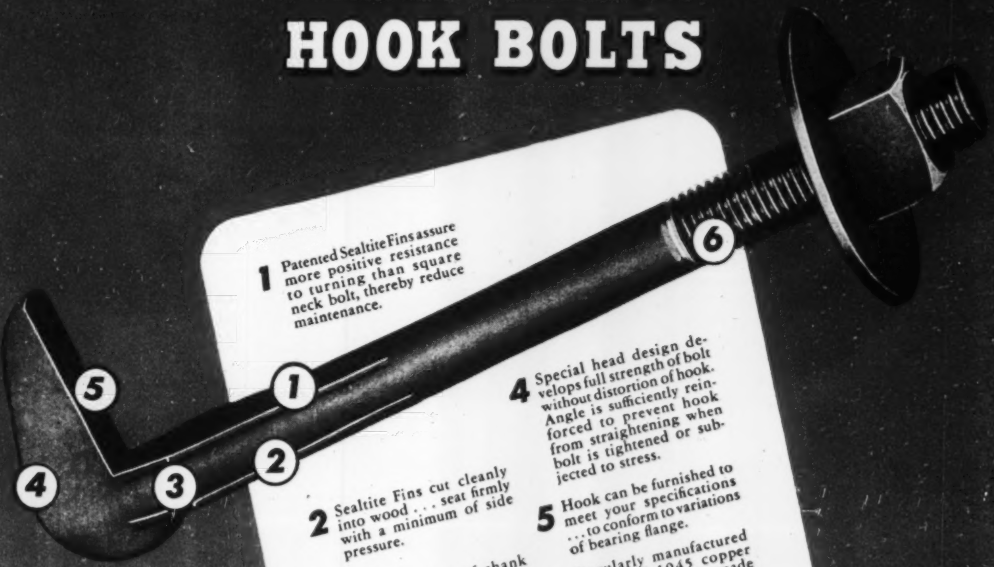
Miscellany—PENN METAL CORP. OF PENNSYLVANIA is celebrating its 80th anniversary this year . . . WALTER BATES CO., INC., has moved from 1707 Rowell Ave., Joliet, Ill., to 500 Milk Road . . . CHAIN BELT Co. of Milwaukee has moved its Los Angeles district office and warehouse to 3838 Santa Fe Ave., Los Angeles 11, Calif. . . . THE TRACTMOTIVE CORP., formerly of Findlay, Ohio, has moved to its new plant at Deerfield, Ill. . . . Construction by THE RUBEROID Co. of a dry felt mill to be erected on property adjoining the company's asbestos and asphalt roofing mills on Emogene Street, Mobile, Ala., is to be started immediately . . . THE CLEVELAND CRANE & ENGINEERING Co., Wickliffe, Ohio, has been purchased outright by THE MCNEIL MACHINE & ENGINEERING Co. of Akron . . . Top Management of MARSH WALL PRODUCTS, INC., has been re-organized for operation as a subsidiary of MASONITE CORPORATION. These six Masonite directors are now on the Marsh board—John Alexander, Jr., Ben O. Anderson, John M. Coates, Mr. Holland, M. P. McCullough and Aytch P. Woodson. Alvin C. Marsh, Victor R. Marsh and John J. Marsh, all former Marsh directors, remain on the new board. Masonite officers moving into Marsh executive positions are Mr. Holland, president; Mr. Anderson, treasurer, and Mr. Coates, assistant secretary. Election of Victor Marsh as executive vice-president, Alvin Marsh as vice-president and John Marsh as secretary and assistant treasurer completed the new roster . . . PERMANENTE CEMENT Co. has purchased a 5-acre section of the Portland, Ore., shoreside tract known as the Albina River Lots. The property, located on the Williamette River shore, is immediately adjacent to leased facilities now being used by Permanente to supply 750,000 lb. of cement for the construction of McNary Dam, on the Columbia River.

◆

Dam the Fire—Construction of a proposed dam across the Little Missouri River may in a few years snuff out North Dakota's "Fires of Hell." The proposed dam promises to douse flames which have burned steadily underground for more than 75 years. Over that time a vein of lignite has burned steadily below the earth's surface, creating three miles of miniature badlands. The burning coal mine now is only three miles from the bid bend of the Little Missouri, where the Bureau of Reclamation is considering construction of a dam.

SEALTITE

HOOK BOLTS



1 Patented Sealtite Fins assure more positive resistance to turning than square neck bolt, thereby reduce maintenance.

2 Sealtite Fins cut cleanly into wood . . . seat firmly with a minimum of side pressure.

3 Non-variation of shank diameter from tip to head prevents splitting of wood . . . assures absolutely tight installation . . . eliminates air pockets and retards corrosion.

4 Special head design develops full strength of bolt without distortion of hook. Angle is sufficiently reinforced to prevent hook from straightening when bolt is tightened or subjected to stress.

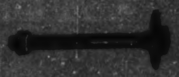
5 Hook can be furnished to meet your specifications . . . to conform to variations of bearing flange.

6 Regularly manufactured from SAE 1045 copper bearing steel. Can be made from other carbon or alloy steel.

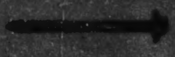
Available in HOT-DIP GALVANIZED-SEALED IN ZINC finish for the economy of longer life.

ILLINOIS CENTRAL

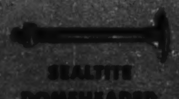
The Illinois Central along with 80% of America's Class One railroads specify one or more Sealtite products for car construction, bridges, trestles, and all other types of timber construction and maintenance.



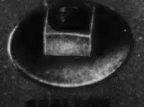
SEALTITE TIMBER BOLT



SEALTITE LAG SCREW



SEALTITE DOMEHEADED BOLT



SEALTITE WASHER NUT

SEALTITE CAR BOLT

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LEWIS BOLT AND NUT COMPANY

504 MALCOLM AVE. S. E.
MINNEAPOLIS 14, MINNESOTA

Manufacturers of Standard Bolts & Nuts, Threaded Rods, Upset Forgings, Drop Forgings.

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Please send my FREE copy of the new 1949 Catalog.

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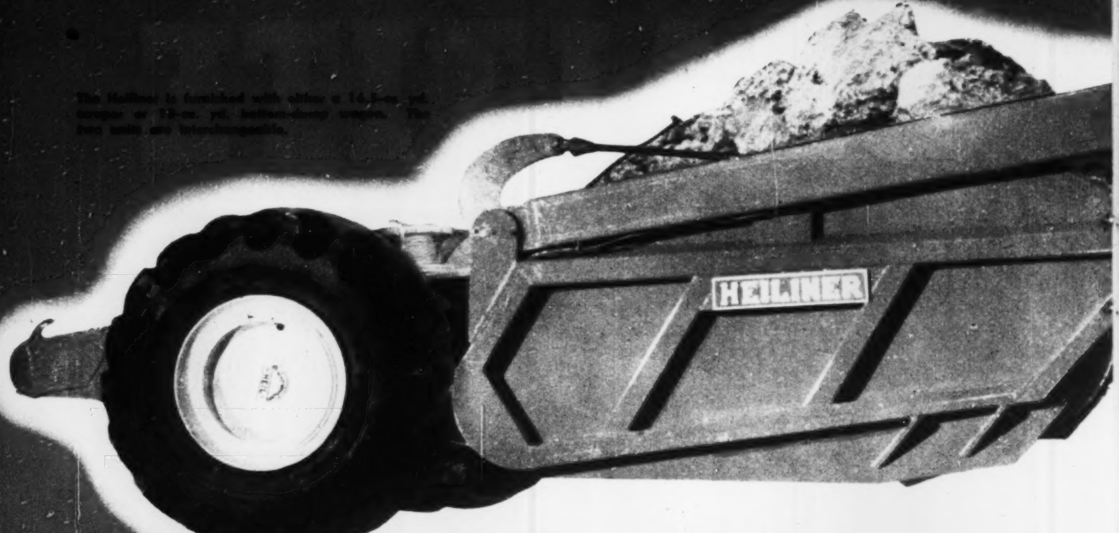
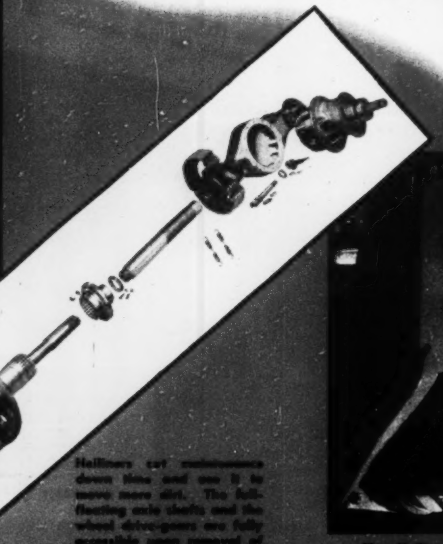


The Heiliner is furnished with either a 16.5-cu. yd. scraper or 13-cu. yd. bottom-dump wagon. The two units are interchangeable.

THE Heiliner *Puts More*

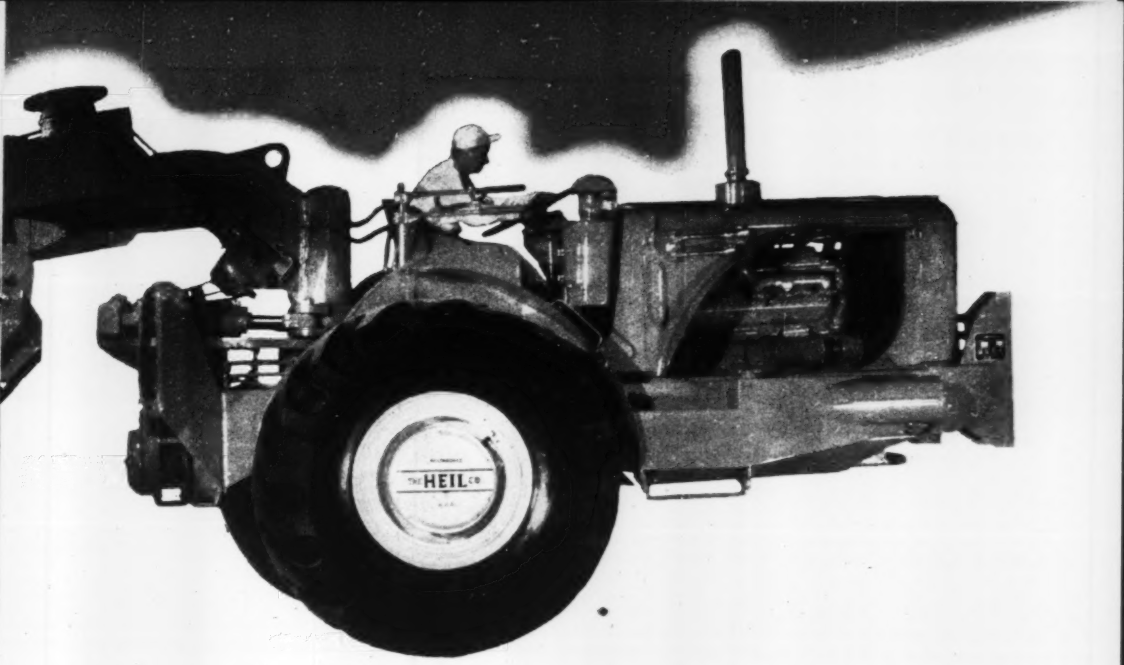
HYDRO
HEIL
STEER

The Heiliner is easy to maneuver. Your operator can turn the 39 foot unit in a 23-foot radius. No physical effort is required — the Hydro-Steer does all the work.



Heiliners cut maintenance down time and use it to move more dirt. The full-floating axle shafts and the wheel drive-gears are fully accessible upon removal of the hub caps. You don't have to pull the wheels.

The Heiliner's cable power-control unit gives you long life and low-cost operation. The smooth-operating brakes and cushioned clutch action eliminate jerks and shocks — reduce wear on the cables. The large drums run cool. Finger-tip control gives your operator fast, effortless action.



Gives You Faster Haul Cycles

Profit in Your Pocket

1 Because the Heiliner's super-axle, with its overall gear reduction of 153 to 1, provides a low-torque drive that gets every bit of power out of the new 200 hp Cummins Diesel.

2 Because Heil's patented, positive Hydro-Steer prevents nosing, snaking, or jack-knifing—lets your operator run at highest possible speeds, make more round trips.

You can count on larger earthmoving profits, when you have these and many other Heiliner features working for you. Send for complete information about the Heiliner and the complete line of Heil earthmoving equipment. Check the coupon and mail it today.

HEIL

THE HEIL CO.
Dept. 139
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Please send me complete information on the items I have checked below:

☐ **Heiliner**—2-wheel prime mover
☐ **Scrapers**—tractor-drawn
☐ **Hydraulic Dozers**—specify make of tractor
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The fourth of a series in the interest of more efficient use of steel . . . a vital American resource.

INHERENT STRENGTH

the strength of rail steel plus the bond of Laclede Multi-Rib Design

The actual inherent strength of rail steel is fully harnessed for work in the Laclede Multi-Rib bar design. Rail steel rolled into bars with Multi-Rib design offers a yield strength *in excess of* 55,000 PSI—with greatly increased anchorage. Laclede Multi-Rib Reinforcing Bars meet the new ASTM Specification A 305-47T, which provides a long-needed yardstick for anchorage in reinforcing bars, assures a more efficient use of steel.

Modernize your specifications with ASTM A 305-47T!
Modernize your steel reinforcing with Laclede Multi-Rib Bars!

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Producers of Construction Steel
LACLEDE STEEL COMPANY
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Diamond Core
Drilling
CORE BORINGS
for Foundations, Dams, Bridges and all Heavy Structures
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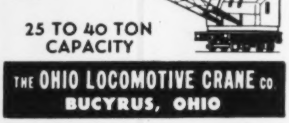
LOCOMOTIVE CRANES
GASOLINE • DIESEL
ELECTRIC • STEAM



25 TO 40 TON CAPACITY
THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

Men and Jobs

Earl G. Harrington recently moved up from assistant chief to chief of the division of engineering in the Bureau of Land Management, Department of the Interior, succeeding **Albert C. Horton, Jr.**, retired. During 40 years of almost continuous service with the Interior Department, Mr. Harrington rose through successive grades of the cadastral engineering organization to his present post. He performed government surveys in 22 states and in 1928-29 was granted leave of absence to survey the boundary line between Wisconsin and Michigan. In 1945 he became assistant supervisor of surveys, Cadastral Engineering Service, in Denver, and in 1948 moved to Washington as assistant chief of engineering.

Don McBride, secretary manager of the National Reclamation Association, Washington, D. C., has resigned to become manager of the Oklahoma Water Development Association, formed by 25 Oklahoma City businessmen to develop water and soil resources in Oklahoma and in the watersheds of the Red and Arkansas rivers. Mr. McBride, former state engineer of Oklahoma from 1939 to 1946, was president of the Association of Western State Engineers in 1941. His new office will be in the Skirvin Tower, Oklahoma City, Okla.

John C. Norton, civil engineer and surveyor has removed from Royal Oak, Mich., to 415 Fifth St., Traverse City, Mich.

Election of **Timothy G. Sughrue** of Swampscott, Mass., as executive vice-president of the Boston & Maine Railroad was announced recently. He has been chief engineer of the Boston & Maine and Maine Central railroads since 1942. He is a graduate of the University of New Hampshire. **Stanley G. Phillips** of Portland, Me., has been appointed chief engineer. He is a graduate of the University of Maine and was formerly with the Lehigh Valley Railroad. **James W. Wiggins** has been made maintenance engineer of the Maine Central. He is a graduate of the University of Maine and started on the Erie Railroad.

Kent Mathewson has resigned as city manager at Asheboro, N. C., to become city manager of Martinsville,

(Continued on page 252)

CHOOSE "QUICK-WAYS" FOR SURE PROFITS!

REG. U. S. PAT. OFF.

PORTABILITY AND CAPACITY . . . these are the fundamentals you KNOW you want in a truck shovel. You get PORTABILITY in a *"QUICK-WAY"* because it is built of steel for lightness and strength, no heavy counter-weights to slow you down. You get CAPACITY because balance and stability are designed into your *"QUICK-WAY"*.

In addition you get SPEED . . . PERFORMANCE . . . VERSATILITY . . . INTERCHANGEABILITY . . . SIMPLICITY . . . ECONOMY OF OPERATION . . . LOW FIRST COST . . . LOW MAINTENANCE . . . and EXTRA PROFITS.

A *"QUICK-WAY"* mounts on ANY standard truck of proper size to go anywhere a truck can go at truck speed. A *"QUICK-WAY"* is CONVERTIBLE IN MINUTES from Shovel to CRANE, DRAGLINE, CLAMSHELL, PILE DRIVER, SCOOP, TRENCH-HOE or BACK FILLER. You buy only the attachments you want. A *"QUICK-WAY"* is simply built, with many interchangeable parts, all easy to service . . . and durable.

THE FUNDAMENTALS built into every *"QUICK-WAY"* add up to sure profits on a small investment, with one of the most useful machines you can own.

NO MATTER WHAT OTHER EQUIPMENT YOU OWN, you need *"QUICK-WAYS"* too. There's a *"QUICK-WAY"* owner near you; ask HIM.

- *Service available from Distributors strategically located throughout U. S. Others worldwide*

MODEL E: 4/10 cu. yd. cap., mounts on any standard 5-ton truck.

MODEL J: ¼ cu. yd. cap., mounts on any standard 1½-ton truck.

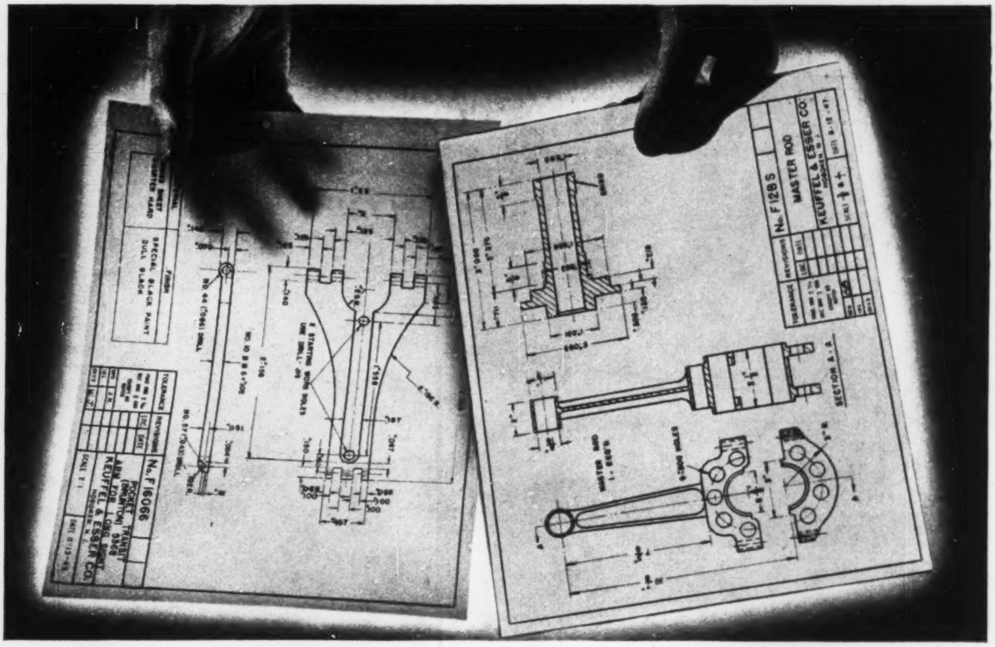
For speed, portability, economy of operation, and adaptability to a wider range of jobs, nothing of comparable size equals a *"QUICK-WAY"* Truck Shovel.

"QUICK-WAY" TRUCK SHOVEL CO.

DENVER, COLORADO

K+E partners

For 82 years K&E equipment and materials have been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SECTION A-A

ONLY HELIOS* DRY DEVELOPING MATERIALS GIVE YOU:

K&E QUALITY. Trusted by draftsmen and engineers for 82 years.

K&E DEPENDABILITY. Your best assurance of consistent results in making positive line prints.

Only when you use dependable materials can you get consistent results in making positive line prints.

To be sure of absolute K&E standards in the color-forming components required for these dry diazo products, we established a new plant where we manufacture HELIOS materials exclusively. We not only control and make the finished materials, but actually manufacture, from the raw materials, the image-forming chemical components as well. Thus HELIOS papers, cloths and films are the product of 82 years of K&E experience and K&E insistence on quality first.

HELIOS dry developed materials cover a wide field of reproduction needs. They consist of opaque papers (black, blue and maroon line) and opaque cloth for working prints, besides transparent papers and cloth and clear and matte films, for intermediate originals (to use instead of originals).

in creating . . .

partners of the draftsman, the engineer and the scientist in shaping the modern world

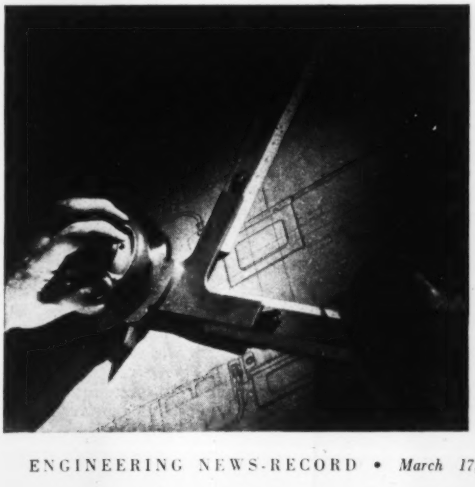
For samples and full information about the HELIOS line and what it can do for you, ask any K&E Dealer or Branch or write us here in Hoboken, N. J.

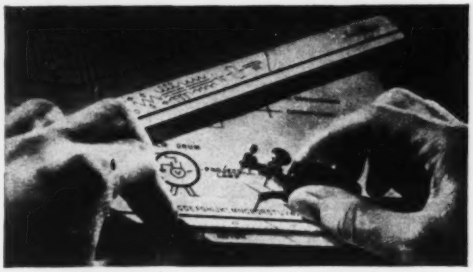
PARAGON* DRAFTING MACHINES TAKE WASTE MOTION OUT OF DRAWING

The PARAGON Drafting Machine combines T-Square, triangles, protractor and scales, all in one single unit, controlled entirely by one hand. The scales glide into any position on the board. The lightest touch rotates them to the angle desired. You can draw all lines to exact length.

The design of the PARAGON Drafting Machine assures permanent accuracy. The open center arm construction makes it practically impossible to disturb the band tension, which is properly set at the factory and needs no further adjustment.

Let your K&E Dealer or Branch demonstrate this machine or write for full description to Keuffel & Esser Co., Hoboken, N. J.





LEROY* LETTERING AND SYMBOL DRAWING IS UNIFORM AND QUICK

LEROY lettering and symbol drawing need no special skill or training. LEROY equipment offers a wide variety of alphabets and sizes, including Regular Gothic, Reversed, Condensed, Extended and Outline Gothic, Cheltenham, Greek, Isometric alphabets and ellipses, Electrical, Map and Welding symbols.

K&E can make special LEROY templates with your own words, phrases, designs, symbols or trade marks.

Ask your K&E Dealer or any K&E Branch for a demonstration or write to K&E, Hoboken, N. J. for the LEROY Booklet.

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K+E

Drafting, Reproduction, Surveying Equipment and Materials. Slide Rules, Measuring Tapes.

KEUFFEL & ESSER CO.

EST. 1867

NEW YORK • HOBOKEN, N. J.

CHICAGO • ST. LOUIS • DETROIT • SAN FRANCISCO

LOS ANGELES • MONTREAL

Where Wood Needs Protection from DECAY and TERMITES

WOLMANIZED PRESSURE TREATED LUMBER

. . . lasts 3 to 5 times longer

Water Tanks
Sills and Joists
Cooling Towers
Roof Decks
Humidified Buildings
Foundations
Floors
Other Moisture "Traps"

Here are six common conditions where WOLMANIZED Pressure-Treated Lumber provides protection from decay and termites:

1. Where excessive ground moisture, rain or thaws cause early decay failures.
2. Where wood near the ground is open to termite attacks.
3. Where wood is in contact with damp concrete or masonry.
4. Where steam and vapor from industrial processes promote wood decay.
5. Where walls, floors, ceilings are subject to condensation from refrigeration.
6. Where wood is exposed to moisture in artificially humidified buildings.

Investigations by qualified technologists prove that on installations where decay and termites ordinarily shorten lumber life, WOLMANIZED Pressure-Treated Lumber lasts *Three to Five Times Longer* than untreated wood.

Such lasting protection is assured because penetrating, preservative solutions are forced, by vacuum-pressure treatment, deeply into the wood fibers of WOLMANIZED Lumber. And, WOLMANIZED Lumber is clean, odorless, paintable, non-corrosive, non-leaching and glueable. Only WOLMANIZED Lumber offers *all* these extra advantages.

YOU'LL PROFIT BY GETTING THIS INFORMATIVE BOOKLET

Get all the facts and cost-saving figures on WOLMANIZED Lumber. See why it offers you the best protection available against wood decay and termites. Write for this valuable booklet today.

AMERICAN LUMBER & TREATING COMPANY
General Offices: 332 South Michigan Avenue, Chicago 4, Illinois
Branch Offices: Baltimore, Boston, Jacksonville, Fla., Los Angeles, New York, Philadelphia Portland, Ore., San Francisco, Washington, D. C.

Va., which recently adopted that form of government.

The engineering firm of Jones & Henry, consulting sanitary engineers, Toledo, Ohio has announced admission to partnership of the following engineers: **George N. Schoonmaker, Spencer D. Downing, Bernal H. Swab,** and **Leon G. Williams.** The name of the firm is being changed to Jones, Henry & Schoonmaker. Mr. Schoonmaker has returned after serving as city manager of Toledo for the last nine years. He was appointed chief engineer of the division of water for Toledo in December, 1937, when the design and construction of Toledo's Lake Erie water supply system was instituted. He continued as chief engineer of the project while serving as city manager. He has been a member of the advisory committee, Ohio Water Resources Board since November, 1944. Messrs. Downing, Swab and Williams have been principal members of the Jones & Henry organization for some years, during which time they have had responsible charge of many important projects. The firm will continue in consulting practice, specializing in sanitary engineering at the Security Building, Huron at Madison, Toledo 4, Ohio.

Philip M. Klutznick, former commissioner of the Federal Public Housing Authority, will head a committee to go to Israel to aid in developing a housing program there.

W. B. Munson has been named office engineer for the Vancouver, Wash., district of the Washington State Highway Department. He has worked with construction firms in Alaska for the last eight years, first on the Alcan highway and most recently at the Eilson Field Air Force Base near Fairbanks.

W. L. Turner, deputy county engineer of Stark County, Ohio, has resigned to become Division Four engineer of the Ohio Highway department, succeeding W. H. Moore, Akron. For three years, Turner has been in charge of sanitary engineering for the Stark County engineer's office at Canton.

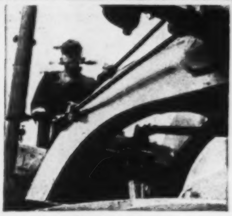
E. W. Eggleston, Commissioner of Highways and Public Works of Tennessee, Nashville, has announced the following appointments: **Alva S. Noland** of Franklin, to be state traffic engineer at Nashville; and **P. P. Thomas** of Nashville, to be division maintenance engineer for the fourth division at Jackson. For the last several years Thomas has been office engineer for

Easy does it – with ADAMS

1 Positive Mechanical Control System Provides Fast, Accurate Blade Adjustments.

ADAMS
MOTOR
GRADER
No 512
DIESEL

2 Push-Button Starting From Cab —Assures Quick, Easy Starting In All Weather.



3 Good Visibility Gives Operator Always Clear View of Blade and Work.

4 Efficient Steering Gear and Improved Front Axle Design Makes Steering Easy.

Easy operation in a motor grader involves both ease of physical effort and ability of operator to get blade adjustments wanted—quickly, positively—and then being able clearly to see work in progress. That's why the easy operating advantages of Adams Motor Graders (as shown above) are so important. Other advanced Adams features include generous blade clearances—high-arch front axle—convenient control levers—standing or seated operation. For complete information, see your local Adams dealer.

Adams

MOTOR GRADERS • LEANING WHEEL GRADERS • ELEVATING GRADERS

BATES•GRATES

fit into every plant picture

If yours is an application like this—with pipes, installations and stairways cutting into the area—BATES•GRATES will give you neat, safe and strong open steel flooring.

Here's where BATES•GRATES win universal approval—where a series of stairways combine with short walkways. Safe and strong, plenty of light and ventilation all the way down.

You can use BATES•GRATES for flooring any area or running any stairways. They serve to advantage in many ways: They are strong, safe, easy to maintain, durable, provide maximum lighting and ventilation.

The simple directness of BATES•GRATES engineering accounts for these advantages. The key is the Hex Cross bar fillet-welded to stout main bars.

For open steel flooring and stair treads in your plant . . . *Get a Bid from BATES*

BATES•GRATES
WALTER BATES COMPANY, INC.
JOLIET, ILLINOIS

for maintenance in the office of the state maintenance engineer at Nashville.

Stanley G. Phillips, formerly engineer of maintenance of way of the Maine Central Railroad and the Portland Terminal, has been promoted to chief engineer of the railroad and terminal. He is a University of Maine graduate, 1917. He started with the Lehigh Valley Railroad as a rodman and after service overseas with the U. S. Army Engineers, 1917-19, he returned to the Lehigh. In 1929 he was appointed track supervisor on the Central of New Jersey, and he joined the B and M in 1929 as assistant division engineer of the terminal division at Boston.

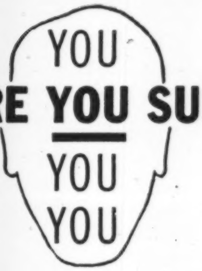
Allan Wagner, who has been public relations manager for the American Society of Civil Engineers since November, 1945, on March 15 becomes public relations director for the American Road Builders Association at Washington, D. C.

C. S. Mullen, chief engineer of the Virginia department of highways, recently completed 40 years continuous service with the department, for the last 24 years as chief engineer.

Franklin R. McMillan, Chicago, Ill., recently retired after 24 years with the Portland Cement Association. He received his civil engineering degree from the University of Minnesota in 1905. Until 1909 he was in railway engineering construction, building construction, and irrigation surveys. For a while he was on the faculty of the University of Minnesota. He joined the Portland Cement Association in 1924 and in 1926 became manager of the structural and technical bureau. In 1927 he became the association's director of research. He is still to serve the association in a consulting capacity.

D. B. Gumensky, for several years chief designing engineer of the National Hydroelectric Engineering Bureau in China, has terminated his work in that country because of conditions there and has returned to the United States. He has opened an office at 124 West Fourth St., Los Angeles, Calif., for general consulting practice, specializing in the hydraulic and structural fields.

Richard B. Gillette has retired as chief of the operations division of the Galveston, Tex., U. S. Army Engineers, to be succeeded by **Kenneth Heagy** of that office. During his 45-year career with the engineers, Mr. Gillette received several awards of merit.



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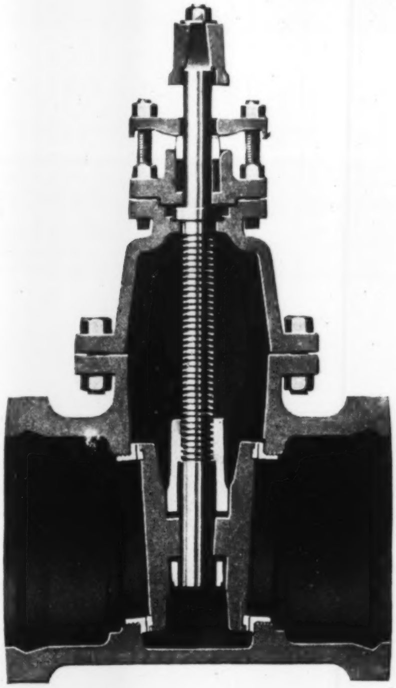
GATE VALVES are used so seldom you can't help feeling uncertain how they will work the next time. That's why cautious buyers base their choice on performance records.

And that's why an overwhelming number of them choose R. D. Wood Gate Valves. They know the reputation of these valves for long and dependable service. Only 3 moving parts to the internal mechanism—spreader and discs. The discs are free to rotate their full circumference when raised or lowered; they are not subjected to drag—and wear at any one point. In closing, pressure is evenly distributed at the center of the discs, which seats them tightly without distortion. No small parts to go wrong. No pockets to collect sediment. Unobstructed flow of water.

Send for complete details. Give your community the safety plus of R. D. Wood Gate Valves, proved in generations of use.



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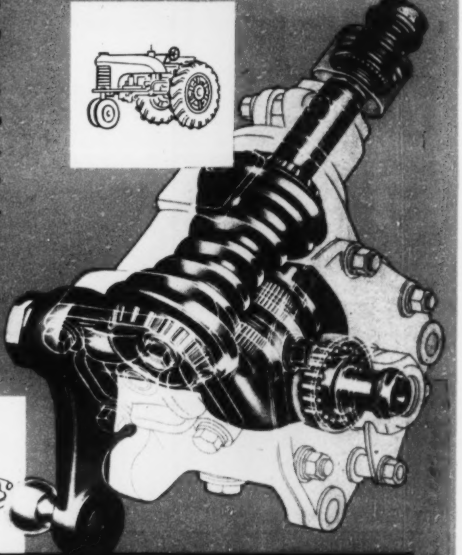


MAKERS AND USERS OF
POWER VEHICLES HAVE PREFERRED
GEMMER STEERING FOR 42 YEARS

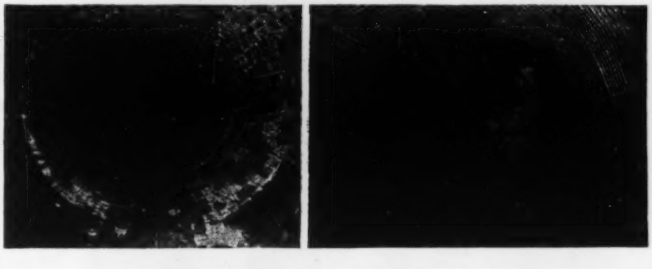
3743

Inspecting bank stabilization and revetment on the Lower Mississippi are, left to right, Wm. R. Harrison, chief of the river construction branch, Vicksburg District Corps of Engineers; John C. Goodrum, assistant chief of the management and technical information branch, and R. H. Haas, chief of the bank protection branch.

There'll be more candy in America when these men move on to another job. Working on an addition that will almost double the size of the Life Savers plant in Port Chester, N. Y., are Charles Lerro, and C. J. Robinson, respectively field engineer and superintendent for the White Construction Co. and Frank L. Jones, resident engineer for Lockwood Greene Engineers, Inc. Robinson has built reinforced concrete buildings since 1905, and Jones, a 1902 Harvard civil engineering graduate, has been a resident engineer for Lockwood Greene most of the time since 1916.

Ray Fullerton, resident engineer, and Frank Bachman, general superintendent, representing Kaiser Engineers, Inc., on the construction of a 52-mile railroad in the Salton Sea Basin of California used this method to get to work. The $3,800,000 railroad will transport iron ore for the Kaiser Co. steel mill in Fontana, Calif.

"GUNITE" RENEWS OLD BRICK SEWERS



These pictures show how we are rebuilding nearly four miles of combination sanitary and storm sewers at Bloomington, Illinois by lining them with mesh reinforced "GUNITE."

Erosion of mortar joints and dislodged bricks made many sections of these 65 year old sewers both dangerous and inefficient. The new "GUNITE" linings will restore them to greater than original strength and result in many more decades of useful service at a fraction of the cost of new sewers.

All work is done without opening streets. Sewer service is maintained by installing temporary flumes or by-passing through relief sewers.

This job and many other profitable uses of "GUNITE" are illustrated and described in our new 64-page General Bulletin A2400. Send for your free copy today.

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"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.
MANUFACTURERS OF THE CEMENT GUN

WALKING IS SAFER
on Hendrick Shur-Site Treads

IDEAL for stairs, ladders and fire escapes, because the square-edge, uniformly spaced steel bars of Hendrick Mitco construction provide a non-slipping, level walking surface, and have no angle irons, bolts or rivets to collect dirt and refuse, or obstruct light and ventilation.

A heavy, flanged nosing-bar makes the edge of each tread clearly visible — an additional safety feature — and also provides reinforcement where the load is greatest. Write for booklet on Hendrick Mitco Products.

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Perforated Metals
Perforated Metal Screens
Architectural Grilles
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"Shur-Site" Treads and
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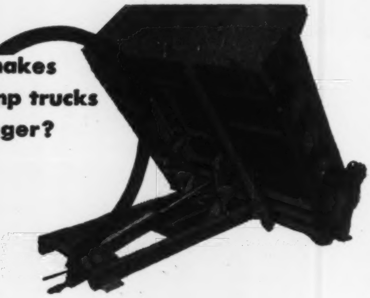
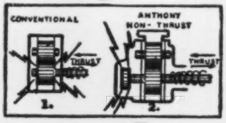
45 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

what makes
some dump trucks
last longer?

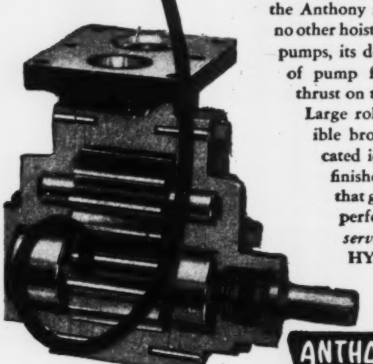


Roller Bearing PUMP with the NON-THRUST feature

ADDS UP TO 700% TO THE LIFE OF ANTHONY DUMP TRUCKS



THE HEART of a dump truck—the pump—plays as important a part in the operation of a dump truck as your heart does to you. And when the pump fails, the hoist fails and the truck stops working. That is why Anthony engineers place such emphasis on the pump. The amazing patented "NON-THRUST" design of the Anthony roller-bearing pump is found in no other hoist at any price. Unlike conventional pumps, its design eliminates the No. 1 cause of pump failure — destructive mechanical thrust on the gears. (See drawings below.) Large roller bearings, extra thick reversible bronze wear plates, pressure lubricated idler gear bearings and precision finished steel gears are other features that give this pump an unequalled field performance record. For *dependable service* DEPEND ON ANTHONY HYDRAULIC HOISTS with the "NON-THRUST" Pump.



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Stang WELLPOINT SYSTEM

For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

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P. O. Box 631, Bell, Cal.

J. J. Russell, general supervisor of construction for Central Mortgage and Housing Corporation, is resigning to return to private practice. He has been responsible for the construction of 24,000 homes and another 11,000 projects under way.

Fred Wemple of Midland, Tex. has been appointed chairman of the Texas Highway Commission to succeed **John S. Redditt**, resigned.

Newly-appointed division engineers of the Ohio Highway Department are: Division 1, Lima—**Walter J. Neidhardt**, Spencerville, succeeding **C. C. Kohli**, Lima; Division 2, Toledo—**George M. Lieber**, Fremont, succeeding **Wilfred B. Robison**, Toledo; Division 3, Ashland—**Joseph A. Tomsic**, Lorain, to succeed **H. W. Mittendorf**, Ashland; Division 5, Newark—**K. L. Rothermund**, Newark, succeeding **F. B. Chappelear**, Zanesville; Division 7, Sidney—**Howard R. Craig**, Wapakoneta, succeeding **Oliver M. Liggitt**, Quincy; Division Four, Ravenna—**W. L. Turner, Canton, deputy Stark County** engineer, to succeed **W. H. Moore**, Ravenna; Division Twelve, Cleveland—**Louis L. Drasler**, Cleveland, succeeding **E. W. Chadeayne**; Division Six, Delaware—**Octave Ammon, Columbus**, to succeed **R. W. Werner**; Division Eight, Middletown—**Joe Unger**, Dayton, acting chief engineer to succeed **J. A. Goldschmidt**; Division 9, Chillicothe—**Joseph N. Doyle**, Waverly, succeeding **Elmer S. Barrett**, Chillicothe; Division 11, New Philadelphia—**Dawson Smith**, Dover, succeeding **Edwin M. McCullough**, Cadiz.

A. C. Lauer, A. G. Swett and **F. Grainger Pierce**, Charlotte, N. C., have formed the General Engineering Co. of Charlotte, to conduct a general engineering business.

Employment of **Jack Jetton, Jr.** as construction engineer of the State Highway Department's district office in Memphis, Tenn., is announced. **J. N. Midyett** of Union City is succeeded by **Newman Glover** of Newbern as district maintenance engineer in a west Tennessee district embracing Obion County.

All engineering operations of the Toledo, Ohio, water division have been consolidated under **Owen Clark**, engineer of construction.

William R. Seeger, assistant chief engineer of the Marin Municipal Water District, San Rafael, Calif., has been promoted to assistant general manager.

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Form and Reinforcement

The placing of floors moves swiftly, smoothly and at a big saving in time and material with Pittsburgh Steeltex Floor Lath. This combination of form and reinforcement for concrete and gypsum floors and roofs eliminates the need for slow, costly form-work.

Pittsburgh Steeltex Floor Lath is a combination of a uniformly spaced welded wire mesh laced to a waterproof cord-reinforced backing. The lacing wires are crimped to permit separation of the backing which gives you automatic imbedment from the weight of the mix. The waterproof backing holds the water in the mix so that it must evaporate slowly which gives maximum strength and assures proper curing of the slab. This also minimizes drip, prevents loss of cement and eliminates cleanup expense.

For better floors and roofs use Pittsburgh Steeltex Floor Lath—it will save you time and money. See our catalog in Sweet's or write for your copy of D.S. 133 to Pittsburgh Steel Products Company, Department EN, Pittsburgh 30, Pennsylvania.

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Engineering Facts about

Johns-Manville TRANSITE PRESSURE PIPE

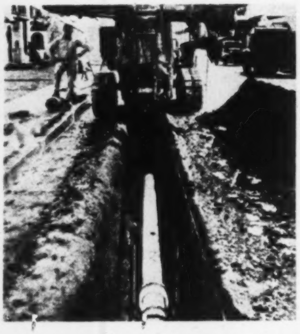
Installation Economies

SINCE the cost of installing the transmission and distribution lines may represent as much as 30 per cent of the total original investment in a water supply system, it is important that these costs be kept to a minimum. Transite* Pressure Pipe offers a combination of installation advantages which have resulted in substantial economies wherever this pipe has been used.

These installation economies start when a Transite Pipe shipment is received. Because Transite is relatively light in weight, unloading and all subsequent handling operations are simplified. More footage can be handled per truckload, trucking costs are lower, and distribution on the job site is easier and more quickly accomplished.

Mechanical handling equipment is not usually necessary except where the larger diameters of pipe are used. The sections of pipe are easily lowered into the trench, either by hand or with the aid of rope slings.

All but the larger diameters of Transite Pipe are unloaded without mechanical equipment and lowered into the trench with slings. Lightness, ease of handling and ready workability contribute to Transite Pressure Pipe's many desirable installation advantages.



In this Transite installation at Long Beach, California, the pipe was laid as fast as the trench was opened. Not more than two newly laid lengths of pipe were ever exposed at one time.

Transite's factory-made Simplex Couplings provide a number of additional installation economies.

Consisting of only three simple parts, this coupling is rapidly assembled to provide a tight, yet flexible joint. A coupling puller is the only tool required for assembly. So rapidly can the pipe be assembled in the trench that the same foreman often supervises both excavation and installation. And this speed of assembly means that trenches need be open only a minimum length of time.

Each joint, moreover, is readily checked for correct assembly as the pipe is laid. This provides advance assurance that the line will meet final test requirements and is a further help in expediting completion of the job.

The flexibility of the Transite Simplex Coupling affords another advantage. It permits deflections up to 5° at each joint, thereby allowing the pipe to be laid around wide curves and across hilly terrain without the use of special fittings.

The workability of this pipe is also a contributing factor to its economy of installation. Transite is adapted to standard water works practice and is readily connected to valves, fittings, hydrants, etc. It is tapped and drilled with standard equipment. The threads are sharp, clean and strong—connections are tight and lasting. Conventional methods are used for making large service connections.

For further details about Transite Pressure Pipe, write Johns-Manville, Box 290, New York 16, N. Y.

Assembling Simplex Couplings is a quick operation. And each joint can be easily checked for proper assembly when it is made, providing advance assurance that the line will meet final test requirements.

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PRODUCTS

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*Transite is a Johns-Manville registered Trade Mark

Elections and Activities

Robert W. McChesney, president of the National Electrical Contractors association and H. E. Foreman, managing director of the Associated General Contractors of America, both of Washington, D. C. have been appointed to the federal committee on apprenticeships.

J. T. Hood, General Electric Co., Portland, has been elected president of the Professional Engineers of Oregon, succeeding Carl Green. Other new officers are J. A. Corenbaum, Pacific Telephone & Telegraph Co., Portland, vice-president, and R. C. Shoemaker, Willamette Hyster Co., Portland, treasurer.

The Mobile, Alabama Engineers Club has asked the city commission for a new building code. The engineers claim the old code is too restrictive as to materials and methods, does not provide enough fees to support a sufficient city building inspection staff, and cannot properly safeguard public safety and health.

Albert Deermont has been elected president of the Florida Road Builders' Association. Other officers are John R. Phillips, vice-president and J. H. Dowling, re-elected secretary-treasurer.

Wylie W. Gillespie of Jacksonville has been elected chairman of the Florida Section, American Waterworks Association. He succeeds W. A. Glass of Miami. Other officers are S. K. Kellar, vice-chairman; A. E. Williamson, secretary; Charles A. Black, chairman of the membership committee; M. R. Boyce, Clifford E. Earls, and S. W. Wells, board of trustees.

Baxter Wade, Jackson, Miss., has been elected president of the Alabama-Mississippi Section of the American Waterworks Association, succeeding Arthur N. Beck, Montgomery, Ala.

New officers of the Seattle, Spokane and Tacoma, Wash., sections of the ASCE are: Seattle—E. L. Strandberg, consulting engineer, president; George I. Teufel, contractor, vice-president; Robert O. Sylvester, assistant professor of civil engineering at the University of Washington, secretary; James H. Reid, with a consulting engineering firm, treasurer. Spokane—L. Vaughn Downs, Bureau of Reclamation, president; Allen S. Janssen, dean

Century

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Write for detailed information applicable to your particular problems.

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VELOCITY-POWER

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This modern self-powered Tool gives you speed, safety and dependability in anchoring conduits, attaching ductwork, hanging pipe or conveyor brackets to steel or concrete! The M.S.A. Velocity-Power DRIVER is the only powder-actuated tool employing an integral stud and piston which remain fastened together until the stud is imbedded — preventing ricochet, flash, recoil or disturbing noise.

• *Driver cannot operate unless safety arm is rotated* and held in position. Demonstrations? Gladly, on request.

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M·S·A

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of the College of Engineering at the University of Idaho, first vice-president; William A. Hill, Washington Water Power Co., second vice-president; J. Byron Barber, with a consulting engineering firm, secretary-treasurer. Tacoma—Arthur Johnson, district engineer for the water and power division of the conservation branch, U. S. Geological Survey, president; John S. Abel, chief engineer, Weyerhaeuser Timber Co., vice-president; Fred D. Langdale, bridge design engineer, state highway department, secretary-treasurer; Arthur M. Buell, assistant bridge engineer, state highway department, director.

Builders Exchange of Columbus, Ohio, has elected M. R. Hausman president, Ralph H. Anderson, first vice-president; C. Curtiss Inscho, second vice-president; and John A. Kight, renamed to a 28th term as secretary-treasurer. Directors named for one-year terms are Glenn C. Grant and F. M. Peart; and for two-year terms, James A. Visintine, Donald F. Morris, Frank J. Lorenz, and John E. Werner.

Bruce W. Weaver, Warren, Ohio, civil engineer and surveyor, has been elected president of the Ohio Society of Professional Engineers, Mahoning Valley chapter, succeeding E. J. Salvidge. Other officers are Albert Coope, vice-president; Harold E. Husted, secretary; Harold P. Syfer, treasurer, and Regner Nielsen, Robert A. Williams, and Donald L. Bostwick, directors.

Utica chapter, New York State Association of Highway Engineers, has elected president, Jay Carncross; vice-president, Jerome E. Burdick; secretary-treasurer, E. Mercer Weiskotten; state director, John S. Hadala.

Virginia Road Builders officers and directors for 1949: Alvin H. Hechler, president; T. E. Ritter, vice-president; and Archer B. Gay, secretary-treasurer. Directors G. P. Clay, J. R. Ford, W. B. Adams, A. B. Torrence, W. N. Jackson, E. V. Williams and W. J. Hardy. Sterry Mahaffey continue as engineer-director.

Mike Dougherty has been elected president of the Memphis, Tenn., Branch of the Associated General Contractors, Sol Lipman, vice-president and W. W. MacLaughlin, Jr. secretary-manager.

Frederic G. Krapf was re-elected president of the Delaware Chapter, Associated General Contractors of America, for his third consecutive term. Other officers P. C. Van Sant, first vice-president; John Dangel, second vice-president; Charles Eckman, secretary; Dominick M. Fontana, treasurer, and Francis E. B. McCann, manager.

I. C. Steele has been elected 1949 president of the Engineers Club of San Francisco. Other officers: Lawrence B. Wright, vice-president; J. A. Polhemus, Jr., secretary, and F. E. Bonner, G. W. Aljian, and E. S. Warner, directors.

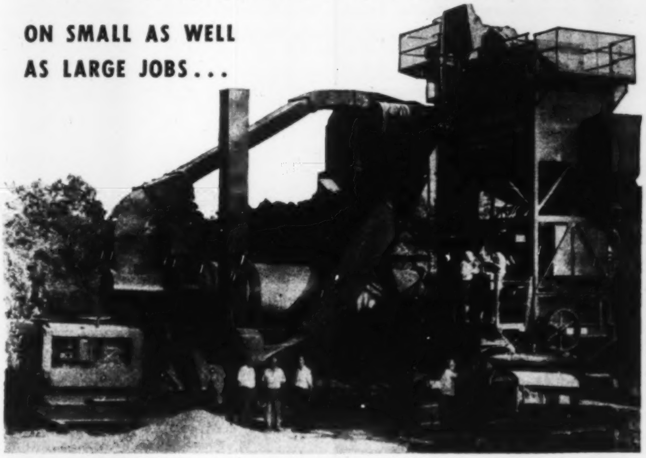
The Engineers Club of Seattle, Wash., has elected O. Ingalls Hall president, with B. A. Travis, vice-president, W. G. Carr, treasurer and E. K. Blackford, secretary. New trustees are Marius Anderson, P. N. Royal and W. J. Royea.

Carl F. Pflugmacher has been installed as president of the Engineers Club of Tacoma, Wash., Walter J. Ryan first vice-president, Clyde Murray, second vice-president, David Countryman, secretary-treasurer and W. D. Smith executive committeeman.

New president of the Associated General Contractors of Idaho is W. R. Cahoon, Pocatello. Serving with him is Duffy Reed, Jr.; vice-pres.

For Efficient Production

ON SMALL AS WELL AS LARGE JOBS...



H&B Model PA Portable Asphalt Plants

MOTO-PAVER

The complete mixing and paving machine for mixed-in-place work. Write for Bulletin MP-47.

Shown above is the Hetherington & Berner PA-30 hot mix plant recently delivered to Memphis Stone & Gravel Co., Highway Contractors, Memphis, Tenn. These PA plants are designed to give efficient production on small as well as large jobs—under a wide variety of operating conditions.

PA plants may be driven with individual motors or from one main power unit for the tower and one for the dryer, using gasoline, diesel, diesel electric or electric power. They are easily portable by truck. Low overall height is maintained by using a flat screen, and can be further reduced by use of a depressed driveway. Write for Bulletin P-46.

HETHERINGTON & BERNER, INC.
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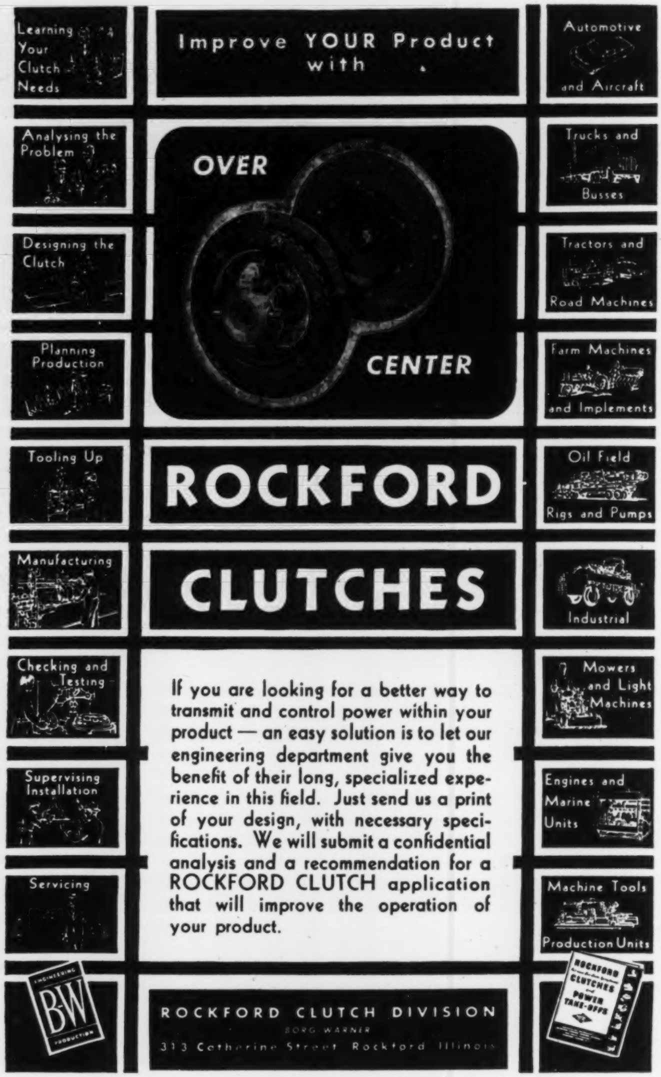
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If you are looking for a better way to transmit and control power within your product — an easy solution is to let our engineering department give you the benefit of their long, specialized experience in this field. Just send us a print of your design, with necessary specifications. We will submit a confidential analysis and a recommendation for a ROCKFORD CLUTCH application that will improve the operation of your product.

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Branch Offices: Denver, Dallas, New Orleans
See our catalog in Sweet's

Falls, vice-president; L. D. Robbins, Boise, secretary-treasurer; and C. B. Launch, E. L. Lessinger and W. Curtis, all of Boise, and L. L. Wheeler of Pocatello, directors.

A new A.G.C. chapter has been formed at Spokane, Wash., by builders who formerly belonged to the Spokane chapter, now devoted exclusively to contractors in heavy construction. R. W. Meighan of the Central Construction Co. is the first president of the new group, known as the Inland Empire chapter. J. L. Hazen of Hazen & Clark is vice-president; Henry George, Jr., of Henry George & Sons, secretary-treasurer; and H. Halvorson of H. Halvorson, Inc., and Harry Roblee of the Gus J. Bouten Co., directors.

Gilbert Stein, Chattanooga, has been elected president of the Tennessee branch, Associated General Contractors of America, succeeding Grover Estes of Memphis. Other officers: Blair Shannon, Johnson City, vice-president; J. A. Kelly, Nashville, treasurer, and Robert L. Alexander, Nashville, secretary.

Lynn Perry, consulting engineer for the Miami, Fla., Sewer and Water Department, has been elected president of that city's section, ASCE, succeeding Edmund Friedman. W. C. Gorman was re-elected secretary-treasurer.

John B. Watson is president of the Greensboro, N. C., Engineers Club. Other officers: F. O. Gibbs, vice-president; Bruce D. Hodges, secretary; C. O. Lowe, treasurer; and Carroll Martin and Edward Lowenstein, directors.

Officers of the Associated General Contractors of West Virginia, Inc., are H. W. Schneider, of Parkersburg, president. Leo Vocellio, J. D. Higginbotham, Ray E. Ritchie, and Walter Seabright, vice-presidents; and W. E. Abbitt, secretary-treasurer.

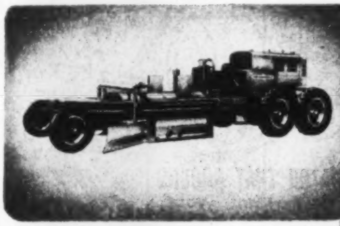
Prof. H. B. Blodgett, dean of the civil engineering school of the University of Nevada, has been elected president of the Reno Engineers' Club. Other officers: Fred Clayton, vice-president; Henry J. Isbell, secretary-treasurer, and Edward S. Parsons, and E. W. McKenzie, the out-going president, directors.

Ernest D. Francis, structural engineer of Sacramento, Calif., has been elected president of the Structural Engineers Association of Central California. W. H. Peterson is vice-president, and W. A. Wassum, A. H. Brownfield and R. W. Hutchinson have been named directors.

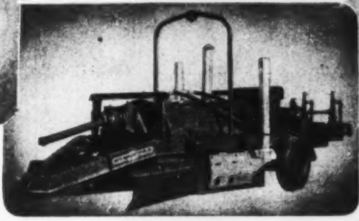
WOOD ROADBUILDING EQUIPMENT

First again in '49

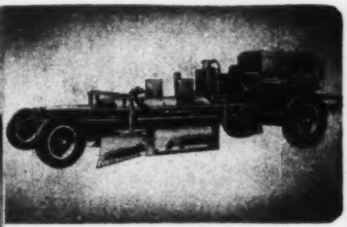
ROADMIX MACHINES



MODEL 42
Self-Propelled



MODEL 54
Tractor-Drawn



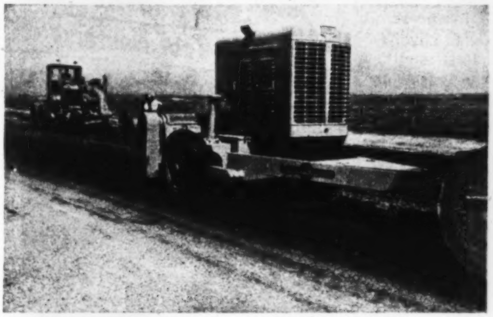
MODEL 36
Self-Propelled

- ***NEW DESIGNS***
- ***MORE ECONOMIES***
- ***INCREASED POWER***
- ***LARGER CAPACITIES***

WANT BETTER ROADS AT LOWER COSTS?

These machines produce a thorough complete mix in one pass at the lowest costs per ton. For mixing stabilized bases and wearing courses with any type of binder. Capacities from 100 to 350 tons per hour. Lowest initial cost and lowest upkeep cost, yet they produce the best quantity and quality.

THE PREPARIZER — A HEAVY DUTY PULVERIZER



P-600 with Motor

PT-600 Tractor Powered

These machines pulverize the old asphalt wearing surfaces making it possible to reuse that select aggregate for base material or the new wearing surface. For soil blending work they have no equal.

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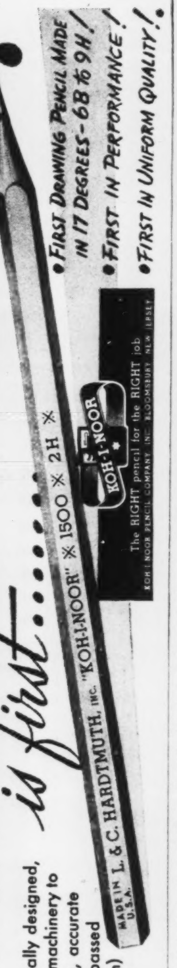
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NEWS BRIEFS

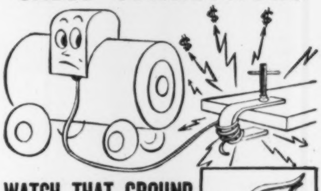
(*Continued from page 70*)

Bridges—Construction of a $2,500,000 bridge across the Patuxent River between CHARLES and CALVERT counties, Maryland, has been approved by Gov. W. Preston Lane Jr. . . . Maj. J. R. Grant, consulting engineer, has been appointed by VANCOUVER, B. C., to prepare drawings and compile information for the new 8-lane Granville St. bridge across False Creek, Vancouver. The structure is estimated to cost more than $7,000,000.

Labor—Heavy construction workers in western WASHINGTON and ALASKA have been granted an increase of 13 cents an hour . . . Wage increases will be sought by all nine building crafts affiliated with AFL in NORTH DAKOTA . . . Structural iron workers in YOUNGSTOWN, OHIO, have gone back to work at $2.25 an hour, with a promised early increase to $2.50, and by May 1 next to $2.37½ the same as CLEVELAND iron workers are getting . . . A 37½-cent hourly wage increase is being sought by the AFL carpenters' union for 5,000 members in CLEVELAND, OHIO. Present rate is $2.37½ . . . AFL building trades unions in ROCHESTER, N. Y. have signed contracts to get carpenters and floor layers $1.70; and composition roofers, $2.10 an hour . . . Plumbers and steamfitters at KOKOMO, IND., got a 15-cents-an-hour increase . . . 200 roofers in the ST. LOUIS, MO., area, have gone on a strike in an effort to get $2.42½ instead of $2.12½ an hour . . . Journeymen plumbers at MEADVILLE, PA., have returned to work after a four months strike. They will get $2.07½ an hour . . . Wage increases of about 25 cents an hour for basic trades in the construction industry of MILWAUKEE, WIS., have been proposed by representatives of seven AFL unions . . . Bricklayers' Local No. 3, KNOXVILLE, TENN., will increase its scale from $2.25 to $2.75 an hour, effective April 1.

Public Construction—The Canadian government is considering the erection of a 15-story office building at EDMONTON, ALTA., to cost about $4,500,000 . . . Legislature of QUEBEC has voted $4,000,000 for drainage and $4,000,000 for provincial office buildings . . . School facilities and housing units at the atomic weapons center at LAS ALAMOS, N. M., will cost over $13,000,000, and contracts for 12 more projects will be let soon . . . Construction of the Baytown-LaPorte tunnel at SPILLMAN ISLAND, TEX., will begin

STOP WELDING LOSSES with TWECO CABLE CONNECTIONS



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If it's hot, your profits are leaking away — you need
TWECO REDHEAD Ground Clamps

Write for Twecolog No. 7 giving data and prices on the complete TWECO line of electrode holders, ground clamps and cable connections for electric welding.

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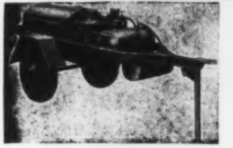

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For road paving or repair work, Hauck Oil Burning Tar and Asphalt Melting Kettles, Tool Heaters and Burners are recognized the best for tough service and ready portability. Prompt shipment of any type or size you need. Write for Highway Construction and Maintenance Catalog.

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in a few months . . . The school board of SAN DIEGO, CALIF., has drawn up a $14,270,000 school building program . . . U. S. Public Buildings Administration proposes a $20,500,000 federal building in BOSTON, MASS. . . . Work is to start soon on a $5,575,000 federal office building at NASHVILLE, TENN. . . . The Corps of Engineers has awarded contracts aggregating nearly $4,500,000 for buildings at LADD FIELD, FORT RICHARDSON and WHITTIER, ALASKA, while the Alaska Native Service announced bids will be called soon for a $10,000,000 hospital at ANCHORAGE. . . . The UNIVERSITY of PITTSBURGH, PA., has broken ground for a field house, launching its $19,450,000 building program. Eight buildings are to be erected. . . . PENNSYLVANIA STATE COLLEGE will take bids soon on three men's dormitories to cost near $4,000,000 . . . The Navy Department says work on the $22,750,000 aeronautical turbine laboratory at TRENTON, N. J., will start this year . . . Plans are being prepared for a $4,000,000 state office building at FRANKFORT, KY. . . . Comprehensive recommendations for flood control and drainage in the WHITE RIVER drainage basin are being made by the Indiana Flood Control and Water Resources Commission. In the meantime, the Corps of Engineers has begun a survey of what INDIANA needs to prevent recurrence of heavy floods . . . City council of BOSTON, MASS., has approved a $30,000,000 Massachusetts legislative act for the demolition of the elevated railway structure from Essex to Dudley Sts., the construction of a Shawmut Ave. subway replacement, and enlargement of the Park Street-Scollay Square subway stations . . . The John McShain Const. Co., Philadelphia, Pa., will build the General Accounting office building in WASHINGTON, D. C., for $21,572,000. Ten escalators and 12 elevators will be constructed by Westinghouse Electric Corp., Jersey City, N. J., for $1,384,999.

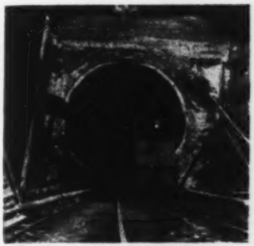
Water Supply and Sewers—The biggest sewer project of recent years in INDIANAPOLIS, IND., is now under way. It consists of the $1,500,000 E. 34th St. main sewer and the $500,000 E. 37th St. main sewer . . . YAKIMA, WASH., is studying a water system improvement including a $400,000 filtration plant, a $1,000,000 pipeline and two $300,000 reservoirs . . . ROANOKE, VA., has authorized the first units of a $750,000 sanitary sewage disposal plant . . . FORT WORTH, TEX., has approved bond issues of $12,400,000 for water and $5,600,000 for sewers . . . The Corps of Engineers describes LAKE OKEECHOBEE, capable of storing a million acre-ft. of water, as the heart

WHITCOMB 8-ton Diesel locomotive pushes two loaded ore cars onto dumping platform on huge tunnel project where five Whitcomb Diesels were employed for fast, economical haulage.

WHITCOMB LOCOMOTIVES

FIRST CHOICE FOR IMPORTANT CONTRACTS

Whitcomb Diesel locomotive pushes ore cars into mouth of tunnel.



Ten 2 meter capacity loaded ore cars are withdrawn by this small but powerful Whitcomb Diesel.

WHITCOMB Diesel locomotives are first choice for important, difficult jobs—offering the low maintenance cost, the dependability, the stamina, the speed needed to assure completion of a job on schedule.

Many contractors amortize the cost of a fleet of Whitcomb Diesels on a single large job, and do so at a profit. Yet, these Whitcomb Diesels are built to give years and years of service. That service frequently calls for a gruelling 24-hour a day schedule under the most difficult conditions.

WHITCOMB Diesel locomotives are individually engineered to meet the haulage requirements of a specific contracting job—designed to be an integral part of a total engineering plan.

Write today for complete information.

Diesel mechanical locomotive from 3 to 30 tons.

Diesel electric locomotives from 25 to 95 tons.

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THIS ONE FACT TELLS YOU MORE ABOUT ATLAS SPEED FORMS THAN ANYTHING WE CAN SAY!

OF ALL THE CONTRACTORS WHO RENTED ATLAS SPEED FORMS IN A 12 MONTH PERIOD

92% BOUGHT THE FORMS THEY RENTED

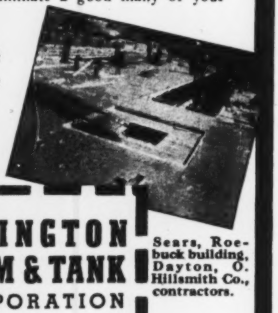
True, we have a liberal rental purchase plan—at any time within 60 days the rental fee can be applied against the purchase price but that's not the story.

Here were 300 experienced contractors, pouring concrete, working in a competitive market, faced with the same sort of costs, time and labor problems that you meet.

These 300 contractors actually tested Atlas Speed Forms right on the firing line. They found out for themselves that multiple re-use brings form costs down to 1¢ per contact foot per use. They found out for themselves that form labor costs are cut in half. They found out for themselves how quick and easy it is to erect and strip Atlas Speed Forms. They found out that they make more money when they use Atlas Speed Forms for poured concrete.

These 300 contractors sold themselves on Atlas Speed Forms by actually using them. Don't you think you should at least find out how they can save time and money for you? How they can eliminate a good many of your headaches?

Send in the coupon and we'll send a data sheet and give you a form estimate and more detailed information.



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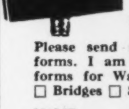
So light a child can lift them



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Please send me information on Atlas forms. I am particularly interested in forms for Walls ☐ Floors ☐ Tunnels ☐ Bridges ☐ Sewers ☐ Columns ☐

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*ATLAS SPEED FORMS are standard forms for pouring concrete walls, floors, and foundations. Also for bridges, tunnels, caissons, pipes, sewers.

of the FLORIDA flood control project . . . YOUNGSTOWN, OHIO, is studying a $10,000,000 sewage disposal project . . . Contracts have been let for a new water reservoir, pipeline and treatment plants at CORBIN, KY., for a little under $1,000,000 . . . An increased water rate has been proposed at MIAMI, FLA., to help finance a new water supply, including a proposed $3,100,000 treatment plant . . . Drury, McNames & Porter, Ann Arbor, Mich., consulting engineers, have surveyed the water needs of FORT WAYNE, IND., and suggested a $7,000,000 rehabilitation . . . MUNCIE, IND., is planning for a large addition to its sewage disposal plant and more sewers for new territorial additions to the city.

◆

ALSO RECORDED

Expensive Rats—"There is a rat for every man, woman and child in the world, and it costs everyone of us $20 a year for what our rat eats and destroys," say Leroy W. VanKleeck, principal sanitary engineer of the Bureau of Sanitary Engineering, Connecticut State Department of Health.

Gritty Records—A suit to restrain the F. W. Case Engineering Construction Co., Van Nuys, Calif., "from applying cement and gravel in their construction operations by methods which permit pollution of the air" has been filed in a Los Angeles Superior Court by the Century Records Co., which asked for $35,000 damages and an injunction, claiming its disk making business had been ruined by fine cement dust. It is said that the dust had gotten into recording machinery and master records, making it necessary to suspend operations. The construction company said that gunite was applied to a warehouse being built next door to Century Records, and that the diskmakers failed to close windows and ventilators during the operation.

Hot Foot for Pigeons—According to the American Public Works Association, pigeons, starlings or any other winged public nuisances that alight on the eaves of the state education building in Albany, N. Y., will get an electric hotfoot. To end a nuisance that long has bothered persons working in the building, the state installed an electronic pigeon evictor which consists of three parallel wires laid along the flat surface where the birds roost. Every three seconds an electrical impulse—not strong enough to kill the birds but uncomfortable enough to make them move on— is sent through the wires.

NOW! FREEDOM IN FLOWMETERING

NEW BETHLEHEM FLOW TUBE

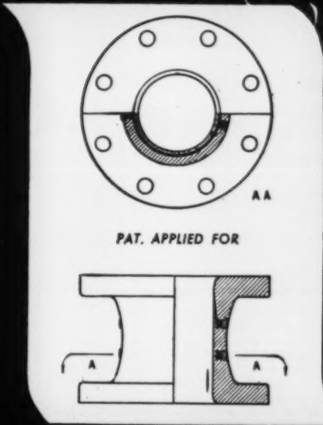
(Gentile Patents)

NO STRAIGHT RUN LIMITATIONS

NEGLIGIBLE RESISTANCE TO FLOW

A constant coefficient over 8:1 range of discharge, higher accuracy, more economy, greater range—these are some of the advantages of the new BETHLEHEM FLOW TUBE. Tested by one of the nation's leading hydraulic laboratories, it consists essentially of a short, straight length of pipe equipped with two groups of pressure nozzles around the inner periphery—one group pointing upstream, the other downstream. The nozzle groups are interconnected by common pressure rings from which connections are made to the high and low pressure sides, respectively, of a standard flow meter.

To measure fluid flow rate with greater accuracy . . . more economy . . . investigate this new primary element now! Write for your copy of the folder, "Bethlehem Flow Tube," today.



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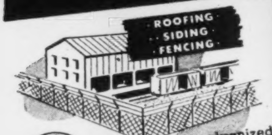
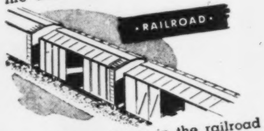
ZINC
SERVES YOU

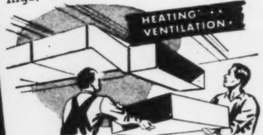
Galvanizing (Zinc coating) insures long-time, low-cost service. For as long as iron or steel is coated with Zinc, it cannot rust. For satisfaction, use galvanized materials. They're "Sealed-in-Zinc" against rust.



TIME proves galvanized sheets stay stronger longer. Used as roofing and siding, they give buildings the "strength of steel" . . . the rust protection of Zinc. The "Seal of Quality" (above) is your guide to economy in buying galvanized sheets. It means they carry at least 2 oz. of Zinc per sq. ft. Galvanizing also lengthens fence life and service.



Galvanized products in the railroad industry guard bridges, cars, buildings, etc., against rust.



Strength, workability and resistance to heat as well as rust make galvanized sheets ideal for heating and air-conditioning.

FREE BOOKLETS

Fully illustrated and packed with practical information on galvanized sheets and Metallic Zinc Paint. Send for them, *today!*

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Send me without cost or obligation the illustrated booklets I have checked.
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Engineering Schools

Hydrodynamics Laboratory

Plans for immediate construction of a hydrodynamic laboratory and model ship towing tank at the Massachusetts Institute of Technology have been announced. It will provide extensive facilities for research in the behavior of liquids and gases.

"This new building," explained President James R. Killian, "will meet the most acute of the institute's current needs for facilities to broaden its educational and research program in engineering and technology."

The laboratory is expected to cost at least $500,000. Construction is now beginning although available funds are being supplemented temporarily by unrestricted funds of the institute. Two stories in height, the building will provide for extensive research facilities as well as for offices, drafting rooms, and service facilities. It will include a towing tank to be used primarily to study the hydrodynamic properties of ship hulls and hydroplane floats.

Studies in the hydrodynamics field already under way at the institute will be continued and expanded in the new building, according to Arthur T. Ippen, professor of hydraulics.

Faculty News

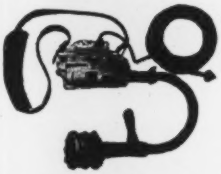
Fred Ward Cox, Jr., a 1936 Georgia Tech. graduate, has been appointed assistant director of the institute's engineering experiment station.

Prof. John C. Rathbun who has taught civil engineering at the college of the City of New York for 18 years, has retired. He is credited with originating and developing the elastic skew arch theory, used in overhead crossroad construction.

Odd Albert, consulting engineer, who has been instructor at Manhattan College and the Polytechnic Institute of Brooklyn, has been appointed associate professor of civil engineering at the latter college. Recently, Mr. Albert ranked first among 200 applicants for the civil service position of administrative engineer in the Newark, N. J., school district.

Dean David L. Arm of the University of Delaware's school of engineering has been elected chairman of the resident instruction section of the engineering division, association of Land Grant Colleges.

"BERG"
CONCRETE SURFACER
MODEL A



"Berg" equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available, permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

THE CONCRETE SURFACING MACHINERY CO.
4667 SPRING GROVE AVE.
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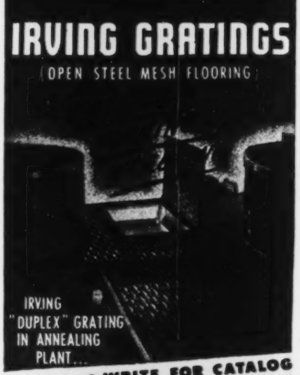
Do you know that
every year thousands
of plants are made
SAFER
MORE COMFORTABLE
MORE EFFICIENT

IRVING GRATINGS
(OPEN STEEL MESH FLOORING)



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OBITUARY

Theodore M. Focke, 78, for 25 years dean of Case Institute of Technology before his retirement in 1943, and for 51 years a member of the faculty, died in Cleveland, Ohio, March 2. He was graduated at Case in civil engineering in 1892.

Charles E. Reinicker, 63, a civil engineer and an executive of the Philadelphia Chamber of Commerce, died March 1 at Philadelphia. He was with the War Production Board for four years, serving as deputy director of the Philadelphia region. Formerly he had been with the United Gas Improvement Co. for 22 years where he had been assistant to the executive vice-president. He joined the Chamber of Commerce staff in December 1945 to handle production problems and industrial engineering for the industry council of the chamber and the Board of Trade. He studied civil engineering at Rensselaer Polytechnic Institute.

Price Wetherill Janeway, Jr., 58, engineer and attorney died February 28. He lived at Media, Pa. He was patent attorney for the United Engineers and Constructors, Inc. for the last three years. He held a similar position with the United Gas Improvement Co. from 1925 to 1945. He was a graduate of Lehigh University, 1913.

John Strawbridge Lloyd, Jr., a civil engineer and president of the engineering firm of Lloyd Associated Inc., died Feb. 11. He lived at Rosemont. Pa.

Max Schweid, Jr., 62, a construction engineer for the New York State Department of Public Works office in Rochester, died Feb. 28. He was a graduate of Cornell University school of engineering and had been associated with the Rochester engineering department before joining the state public works department 10 years ago.

James B. Harley, member of the construction firm of Pennell & Harley, South Carolina, died Feb. 27. A graduate of Clemson College, he received his civil engineering degree from the University of South Carolina.

Col. Robert Hill, 61, of the Army Corps of Engineers, died Feb. 27 in Oakland, Calif., from the lingering effects of Japanese imprisonment. He had been in charge of delaying the Japanese when American forces retreated to Bataan. Upon the surrender he was captured and imprisoned for 42 months at Camp Cabanatuan.

MAYO
TUNNEL & MINE EQUIPMENT

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for Tunnels, Sewers and Aqueducts
Write for Bulletin No. 12

TUNNEL SHIELDS
Complete With Hydraulic Equipment

AIR LOCKS

PNEUMATIC GROUTERS
Write for Bulletin No. 13

ROBERT S. MAYO
Civil Engineer
LANCASTER, PENNSYLVANIA

Cross-Country Jobs Demand "Light Weight *Plus* Dependability"...
SUPPLIED BY

WISCONSIN
Heavy-Duty *Air-Cooled*
ENGINES

"Light weight *Plus* Dependability" really paid off on this subsurface exploration job across 11 miles of swamp and lowlands in Pennsylvania! Searching for a highway cut-off, this Acker Test Boring Rig, powered by a Heavy-Duty Air-Cooled Wisconsin, traveled on skids or oil barrel pontoons along the entire stretch, taking borings to depths of 60 feet.

Typical of Wisconsin built-in dependability is the mounting of the drop-forged crankshaft on tapered roller bearings at BOTH ends, to take up end thrust and radial thrust which permits mounting drive pulley, gear or sprocket directly on the extended crankshaft.

Specify Wisconsin Air-Cooled Power for "Most H.P. Hours" of on-the-job service . . . 2 to 30 hp., 4 cycle single-, two- and four-cylinder types.

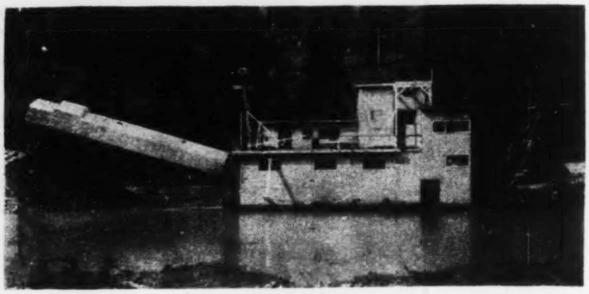
MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air Cooled Engines
MILWAUKEE 14, WISCONSIN

REDUCE DOWNTIME

with YUBA DREDGE PARTS

Made for all dredges...long-wearing... built to fit exactly . . . quick delivery



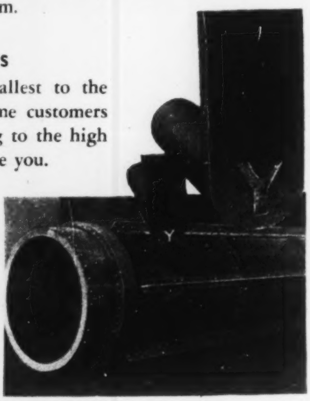
Yuba pioneered the use of alloy steels and heat-treating in the manufacture of dredge parts. You are sure of long-wearing, tough parts when you buy Yuba bucket pins, Abrasion Resisting and Manganese Steel screen plates, tumblers, ladder rollers, pumps, and other dredge parts. Yuba parts are carefully machined, enabling you to make field replacements quickly, and keep your shut-down time to the minimum.

Bucket Pins of all Sizes

Yuba makes bucket pins from the smallest to the largest diameters, and has supplied some customers with pins ever since 1912; thus attesting to the high quality and satisfaction our pins will give you.

A. R. S. Screen Plates

Yuba Abrasion Resisting Steel screen plates were developed especially for tough dredge service. Holes are taper drilled, uniformly spaced, to give you efficient and accurate screening. A.R.S. plates are stocked in all usual thicknesses from $\frac{1}{4}$" up.



Yuba parts, such as bucket pins and A.R.S. screen plates shown here, increase average daily running time and profits.

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Union College celebrates Squire Whipple Day

A commemorative meeting full of meaning for every civil engineer and construction man was held at Union College, Schenectady, N. Y., Feb. 25 when the annual Founder's Day exercises were focused on the career of Squire Whipple. A graduate of Union in 1830, Mr. Whipple is best remembered for the Whipple truss which he invented, but he is in fact the father of scientific bridge design in America.

The program at Union consisted of three papers by well known engineers who reviewed Whipple's life and work. Prof. Mortimer F. Sayre described Whipple's life in college. Shortridge Hardesty, consulting bridge engineer reviewed Whipple's contributions to American engineering. Carl B. Jansen, president, Dravo Corp., Pittsburgh, and a Union alumnus, discussed the future of bridge building and the debt that the art owes to Whipple. At the close of the exercises honorary degrees of Doctor of Engineering were conferred on Mr. Hardesty and Mr. Jansen.

Although Squire Whipple's greatest contribution was his book "A Work on Bridge Building", he was even more proud of a philosophical moral essay which he called "A Way to Happiness, being an Essay on Motives to Human Actions and the Fundamental Principles of Morality."

Mr. Hardesty paid tribute to the remarkable character of "A Work on Bridge Building." For an original work, said Mr. Hardesty, it shows that he had a surprisingly complete grasp of the subject. He presents the calculations of stresses for both fixed and movable loads . . . employing short-cut processes that are logical and still useful. A point that greatly impressed Mr. Hardesty is that he made "quick comparisons of the relative weights of different truss framings by figuring for each type of the stresses in all members, multiplying the stress in each member by its length and summing the products." In closing Mr. Hardesty quoted from an editorial in *Engineering News* of March 24, 1888, which shows that Mr. Whipple's abilities were not unappreciated by his contemporaries. The editorial said in part, "The death of Squire Whipple, on March 15, removes from the engineering world a man who by his individuality and originality practically created the modern art of bridge construction. Mr. Whipple seemed to labor purely in the interest of progress. He was modest in his claims and pushed them so little that he realized very slight financial profit from any of his inventions."

Commission wants to be Philadelphia port agency

The Delaware River Joint Commission has asked the Pennsylvania and New Jersey legislatures to pass legislation making it an agency to develop the port of Philadelphia.

In line with a recent report submitted by a New York engineering firm for general port development (ENR Jan. 13, p. 14), the commission asks that its name be changed to the Delaware River Joint Commission Port Authority. The group at present operates only the Delaware River bridge—Philadelphia and Camden.

Urging that it be vested with "broad and extensive powers" to meet new responsibilities, the group pointed out that its jurisdiction would be a newly created port district embracing twelve counties in both states from Trenton to the sea.

For instance, the commission states flatly that it does not intend to increase the Delaware River bridge toll, despite the engineers' suggestion that the basic toll be raised to finance court development; the commission also decided against financing a Philadelphia-South Jersey rapid transit system at a cost of $32,000,000 (estimated).

Also, the group sees no immediate necessity for a major bridge across the Delaware River.

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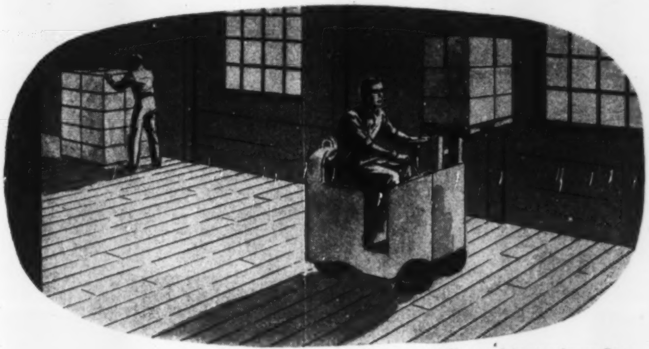

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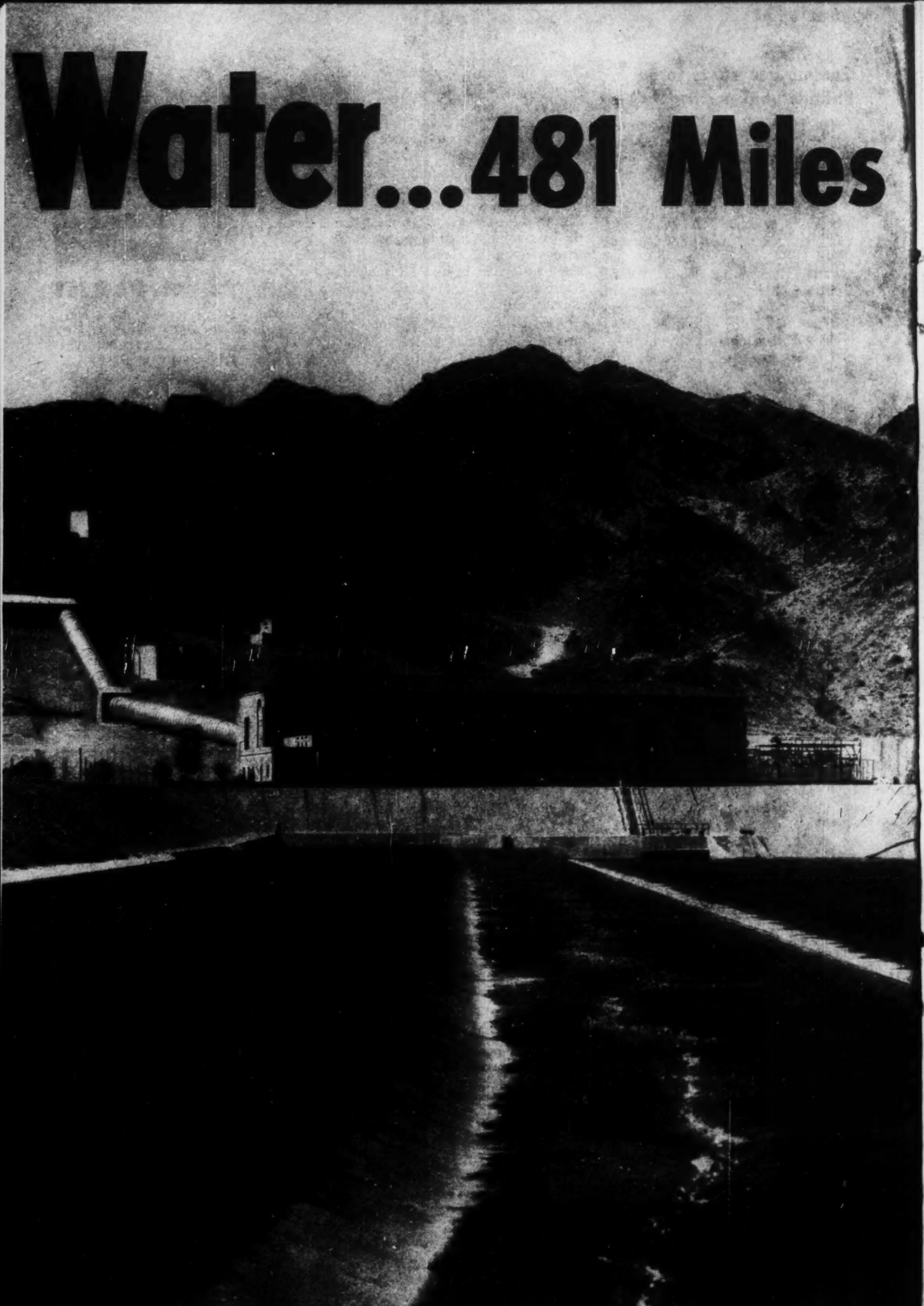

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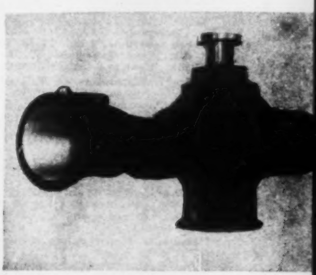

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WATER SUPPLY

●**Calif., San Diego**—City, Civic Center Bldg., Electric Ave. Pipeline, incl. 22,200 ft. 20 in. pipe, appurtenances, supply Pacific Beach and La Jolla Areas, **$360,000**; Kearney Mesa Pipeline incl. 15,500 ft. 36 in. and 24,000 ft. 30 in. rein.-con. pipe appurtenances to Linda Vista and Pacific Beach, La Jolla Areas, **$1,100,000.** Fred D. Pyle, hydraulic engr. G. E. Arnold, dir. Water Dpt., Civic Center Bldg., engr.

Conn., Bristol—City, Frank J. Thiery, supt. Water Dpt., Riverside Ave., water sys. development, incl. 16 in. watermain Forestville Sect. raising Dam at Reservoir 7, constr. filtration plant, water sys., extens. South Mountain, **$500,000.**

Conn., New London—City, City Mgr., Municipal Bldg., exten. watermains, various streets. **$112,000.** Kenneth Holmes, city engr. CD 8/16/46—ENR 9/5/46.

●**Ill., Bedford Park**—Village, 7645 W. 66 St., plans by Alvord Burdick & Howson, 20 N. Wacker Dr., Chicago, watermains, 2 pump. stations, elevated tanks, reservoir. **$1,400,000.**

La., Clinton—Town, c/o Mayor, **$120,000** bond election Apr. 5, WW imprvs.

N. J., Margate — City, reservoir. **$200,000.** Clyde Potts, 30 Church St., New York, N. Y., consult. engr. J. I. Somers, Guarantee Trust Bldg., Atlantic City, engr.

O., Loudonville — City, water treatment plant. **$125,000.** Burgess & Niple, 568 E. Broad St., Columbus, engrs.

O., Mount Vernon—City, water softening plant. **$350,000.** Burgess & Niple, 468 E. Broad St., Columbus, engrs.

Pa., Torrance—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, plans by Sorber & Hoone, 1st Natl. Bank Bldg., Greenburg, replacing water sections in 4 bldgs. at Torrance State Hospital. A. F. Jones, c/o owner, ch. engr.

Pa., West Chester—West Chester Boro, water distr. sys. imprvs. **$300,000.** Albright & Friel, Inc., 1520 Locust St., Phila., consult. engr. CD 11/11/48—ENR 12/9/48.

●**Tex., Ft. Worth**—W. O. Jones, city mgr., Ft. Worth, 60 in. intake Lake Worth, **$250,000,** Joe J. Rady, 811 Insurance Bldg., consult. engr.; 6 m. g. clear well at Holly Water Plant, **$787,000.** Uel Stephens, dir. Water Works, City Hall; 48 in. clear Fork Crossing, **$250,000,** Freese & Nichols, 407 Danciger Bldg., consult. engrs.

Tex., Houston—City, c/o Airport Div., water pump. station, **$120,000;** 600,000 gal. water reservoir, **$100,000.**

Wash., Chewelah—City, City Hall, 500,000 gal. concrete reservoir, 2 mi. 12 in. steel pipeline and distr. sys. **$145,000.** W. L. Malony, Symons Bldg., Spokane, consult. engr.

B. C., North Kamloops — Village Comrs., North Kamloops, water sys. **$110,000.**

Man., Winnipeg—P. Utilities Comn., J. St. John, ch., Winnipeg, WW facilities, various sections city, Approx. **$350,000.** W. D. Hurst, c/o owner, engr.

N. B., Fredericton—Municipality, water extens., Forest Hill, reservoir. **$100,000.** J. D. Mackay, city engr.

Ont., Bowmanville—Municipality, filtration plant, **$100,000.** Proctor-Redfern & Laughlin, 11 Jordan St., Toronto, engrs. CD 11/30/45—ENR 12/13/45.

Ont., Cornwall—Municipality, filtration plant. **$100,000.**

Ont., Ottawa—City and Dominion Govt., exten. 4 mi. 16 in. watermain to 3 Dominion Govt. installations, seminary and housing in Gloucester Twp., 500,000 imperial gal. storage tank. Approx. **$500,000.** N B. Mackostie, 193 Sparks St., engr.

Que., Coaticook — Municipality, reservoir, Coaticook River. **$100,000.** Dpt. Hydraulic Resources, Quebec City, Que., engr.

SEWERS, WASTE DISPOSAL

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., Hall of Records, sanitary sewers in Atlantic St., Altadena, **$100,100.** C. E. Arnold, 205 S. Broadway, co. engr. and surv.

●**Fla., Sarasota**—City, sewer and water exten., sewage disposal plant and line extens. and water treatment imprvs., extens. and water lines. **$2,850,000.** CD 2/1/45—ENR 2/22/45, under Water Supply and CD 2/1/45—ENR 2/2/45, under Sewers.

Fla., Tampa—City, Sect. 5, sanitary sewer program, **$450,000.** Greeley & Hansen, 220 S. State St., Chicago, Ill., engrs. CD 2/14/47—ENR 3/6/47.

Ill., East Peoria—East Peoria Drainage & Levee Dist., East Peoria, pump. station, **$200,000.** Alvord, Burdick & Howson, 20 N. Wacker Dr., engrs.

Ill., Mount Prospect—Village, Village Hall, intercepting and relief sewers. **$430,000.** Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago, engrs. CD 1/15/47—ENR 2/6/47.

Ill., Swansea—Village Bd. Trustees, sanitary sewerage sys. Approx. **$100,000.**

Ia., Monroe—City, City Hall, sewers and sewage plant, **$115,000.** Brown Eng. Co., 322 K. P. Bldg., Des Moines, engr. CD 1/4/46—ENR 1/21/46.

Ia., Windsor Heights, (RFS from Des Moines)—Village, Village Hall, sanitary sewers, **$100,000.** Brown Eng. Co., 322 K. P. Bldg., Des Moines, engr.

La., Shreveport—City, City Hall, plans by William S. Evans, Ardis Bldg., incinerator on Kings Hy. **$200,000.**

Mich., Montague—City, City Hall, sanitary sewers, lift station, **$300,000.** Alfred E. Hansen, 401-2 Michigan Theatre Bldg., Muskegon, consult. engr. CD 8/19/47—ENR 9/4/47.

Neb., Fremont—City, City Hall, storm sewers. **$137,588.**

●**N. J., Linden-Roselle**—Cities of Linden and Roselle (Linden-Roselle Sewer Auth.), intercepting sewer, primary treatment plant. **$3,000,000.** Alexander Potter Assoc., 50 Church St., New York, N. Y., consult. engrs.

N. Y., East Syracuse—Village, pump. station and imprv. sewerage sys. **$120,000.**

N. C., Kings Mountain—Town, Mayor, H. Tom Fulton, bond election May 10, sewer plant imprvs. and extens. to line, **$250,000.** CD 1/26—ENR 2/17.

Pa., Phila.—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, sewage disposal plant at Phila. State Hospital. **$350,000.** H. A. Kuljian & Co., 1200 Broad St., Zone 21, consult. engrs. A. F. Jones, c/o owner, ch. engr. CD 12/20—ENR 1/17.

Tex., Jacinto City (P. O. Houston)—City, L. C. Handler, mayor, 10326 Palestine St., Houston, voted bonds storm sewers, **$130,000.** Frank J. Metyko, Scanlon Bldg., Houston, consult. engr. CD 2/16.

Tex., Jasper—City, Radford B. Gibson, mgr., sewage treatment plant, **$131,000.** Garrett Eng. Co., 5008 Almeda Rd., Houston, consult. engr.

Tex., Pearland—Pearland Fresh Water Dist., Pearland, sanitary and storm sewers, **$100,000.**

Va., Roanoke—City, sewage disposal plant. **$750,000.** Mattern & Mattern, 118 A. Campbell Ave. S. W., Roanoke, Va., and Alvord, Burdick & Howson, 20 N. Wacker St., Chicago, Ill., consult. engrs.

†**Wash., Bremerton**—Yards & Docks Annex, Navy Dpt., Arlington, Va., imprvs. sewage disposal sys. **$600,000.** CD 1/22/48—ENR 2/5/48.

●**Wash., Seattle**—City, County-City Bldg., Zone 4, sewers in area between 12 Ave. S. W. and 42 Ave. S. W. in Longfellow Creek drainage area. **$1,564,000.** R. W. Finke, city engr. CD 3/21/46—ENR 4/4/46.

B. C., White Rock Surrey — Municipality, Municipal Hall, Cloverdale, sewage mains, **$200,000,** sewage disposal plant, **$200,000** machinery for sys., **$86,000.** Burnett, McGugan & Hunter, 30 McKenzie St., New Westminster, engrs. CD 8/13/47—ENR 9/4/47.

Man., Winnipeg—P. Utilities Comn., J. St. John, chn., Winnipeg, trunk sewer extens., northwest part of city, incl. 2 mi. 8 ft. pipe from McPhilip St. to Jefferson Ave., West Kildonan area. Approx. **$450,000.** W. D. Hurst, c/o owner, engr.

Ont., Chapleau—Twp. of Chapleau, c/o T. R. Sere, clk., sewerage sys. **$250,000.** Proctor-Redfern & Laughlin, 11 Jordan St., Toronto, engrs.

Ont., Norwich—Council, sewerage sys. **$100,000-$125,000.** Hagley, Fort Erie, engr.

Que., Greenfield Park—Municipality, collective sewers, **$100,000.** J. A. Lalonde & Co. Ldt., 958 Dunlop Ave., Outremont, engrs.

Que., Montreal — Municipality, incinerator, **$300,000.** H. A. Gibeau, city engr.

BRIDGES

●**Florida**—State Rd. Dpt., Tallahassee,

Manatee Co.—concrete, pile bridge, linking Brandenton and Anna Maria Key, part of coast hy., **$2,000,000,** Baile & Horton, Bradenton, archts.

●**Fla., St. Petersburg** — St. Petersburg Port Authority, St. Petersburg, plans by Baile & Horton, Brandenton, Tampa Bay Bridge. **$15,000,000-$20,000,000.** CD 11/28/47—ENR 12/4/47 under LB.

●**O., Youngstown** — City and Railroads, City Hall, Division St. bridge. **$2,100,000.**

Pa., Oreland—The Reading Co., E. L. Gosnell, ch. engr., Reading Terminal, Phila., Zone 1, grade crossings, abolishing 2 old ones and building 2 at nearby point, overpass approach, altering tracks. Over **$100,000.**

Newfoundland, St. Johns—City, City Hall, repaving, reconstructing Water St. Approx. **$400,000.** Grant R. Jack, c/o owner, engr.

Que., Montreal—Municipality, viaduct reconstruction, Richmond St. **$110,000.** H. A. Gibeau, city engr.

Que., Montreal—Municipality, viaduct over Canadian Pacific R. R. tracks, Cavendish Ave., **$350,000;** subway under Canadian Pacific R. R. tracks, on Christopher Columbus St., over **$100,000.** H. A. Gibeau, city mgr.

●**Tex., Houston** — Harris Co., Courthouse, steel, concrete bridge over San Jacinto River Reservoir. **$1,149,000.** Howe & Wise, 4119 San Jacinto St., consult. engrs. CD 6/9—ENR 7/8.

Washington — Washington State Toll Bridge Auth., Olympia, viaduct at west end of Lake Washington pontoon bridge, **$300,000;** 2 underpasses on Mercer Island at east end of bridge, **$150,000,** King Co. C. E. Andrew, c/o owner, ch. engr.

●**B. C., Vancouver**—City, R. Thompson, clk., plans by J. R. Grant, 500 Beatty St., bridge, Granville St. Approx. **$7,500,000.** CD 9/28/43—ENR 9/30/43.

Ont., Woodbridge (Toronto) — Toronto & York Roads Co., 57 E. Adelaide St. E., Toronto, replacing iron bridge, approaches, Woodbridge-Kleinburg Rd., near here. Approx. **$103,000.** H. C. Rose, c/o owner, engr.

Quebec—Province of Quebec, Quebec City.

St. Aime—bridge over Yamaska River, **$200,000.** Dpt. P. Wks., Quebec City, engr.

STREETS AND ROADS

Calif., Los Angeles — Bd. Supervs., Los Angeles Co., 501 Hall of Records, imprv. Adams St. and other streets, vicinity of Artesia, **$108,300;** Normandie Ave., Manchester to Century Blvds., over **$50,000.** C. E. Arnold, co. engr. and surv.

●**Calif., Los Angeles** — Bd. P. Wks., 153 City Hall, imprv. Roosevelt Jefferson to Imperial Blvds., **$2,206,800;** Imperial Hy. from Ocean Parkway to Sepulveda Blvd., **$400,000.** Lloyd Aldrich, city engr.

Conn., New London — City, City Hall, c. conc. and removing of trolley rails, on State St. **$127,000.** CD 4/11/46—ENR 5/5/46.

Neb., Lincoln — City, City Hall, widening, repaving 27 St. from O to H Sts. and E. to South Sts. **$271,000.** D. L. Erickson, city engr. CD 10/8/47—ENR 10/16/47.

N. J., Atlantic City—Atlantic City Comn., City Hall, resurfacing Lincoln Ave., etc. **$61,778;** Brigantine Blvd., etc. **$50,000.**

●**Tex., Conroe** — Montgomery Co., Robert H. Lindsley, judge, Courthouse, road constr., paving and imprvs. existing roads, throughout county. **$1,000,000.** CD 4/2/47—ENR 4/17/47.

Tex., Houston — Harris Co., Courthouse, 12.69 mi. road constr. and permanent type paving Atascocita Rd. **$900,000.** Howe & Wise, 4119 San Jacinto St., consult. engrs. CD 6/9—ENR 7/8.

Tex., Jacinto City (P. O. Houston)—City, L. Chandler, mayor, 10326 Palestine St., Houston, voted bonds Feb. 26, street imprvs., repairing roads and bridges. **$100,000.** Frank J. Metyko, Scanlon Bldg., Houston, consult. engr CD 2/16.

Tex., Teague—Freestone Co., c/o Judge, Courthouse, road constr. **$350,000.**

Va., Virginia Beach — City, street imprvs. **$275,000.**

●**Washington**—State Hy. Dpt., Olympia,

Adams Co.—highway from Primary State Hy. 18 east of Ritzville to junction with Primary State Hy. 3, near Union Flat Creek. **$50,000.**

Benton Co.—completing Track road from Goldendale Hy. to Prosser, **$1,000,000.**

Douglas Co.—road from Secondary State Hy. 10-B to Crown Point near Grand Coulee Dam, **$50,000.**

highway from Bridgeport to Leahy, **$470,000.**

Skagit Co.—wid'n. 8.2 mi. Secondary State Hy. 1-C from Edison to junction with Anacortes branch, **$675,000.**

1.1 mi. Edison to Chuckanut branch, **$95,000.**

wid'n. 1.3 mi. Hy. 1-F, Chuckanut branch to main branch of Hy. 1, **$80,000.**

1.2 mi. from Junction with Hy. 1 to Sedro-Woolley, **$240,000.**

Wid'n. 5.1 mi. Secondary Hy. 1-H from Conway to Secondary Hy., 1-A at MacMurray. **$340,000.**

relocating Secondary State Hy. 1-A 1.2 mi. from Snohomish Co. line to junction with Hy. 1G, **$1,200,000.**

5.7 mi. from junction with 1-G to Sedro-Woolley, **$685,000.**

9.7 mi. Sedro-Woolley to Whatcom Co. line. **$1,170,000.**

resurf., wid'n. 5.7 mi. Hy. 1-D from Deception Pass to junction with Hy. 1, **$700,000.**

wid'n. 3.3 mi. Hy. 1-E from junction with Hy. 1 to junction with J-A. **$380,000.**

wid'n. 3 mi. Hy. 1-C, Burlington west to junction with Anacortes branch, **$350,000.**

wid'n. 5.3 mi. Anacortes-Mount Vernon Hy. from Anacortes to Snohomish Slough, **$1,130,000.**

wid'n., straightening 6.3 mi. from Whitney to Mt. Vernon, **$625,000.**

constructing 74.8 mi. new cross-state hy. from Marblemount to Mazama, **$10,138,000.**

wid'n. Primary State Hy. 17, Sedro-Wooley to Hamilton, **$885,000.**

wid'n., straightening 6.5 mi. Hamilton to Birdsview, **$340,000.**

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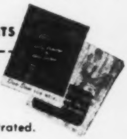

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9.2 mi. Rockport-Marblemount, **$900,000.**

wid'n. Primary State Hy. 1 from Snohomish Co. line to Conway, **$750,000.**

relocating 4.2 mi. from Conway to Mt. Vernon, **$1,520,000.**

wid'n. 0.6 mi. from Mt. Vernon to junction with Hy. 1-G, **$260,000.**

wid'n. 2.9 mi. from junction with Hy. 1-G to junction with Burlington-Chuckanut cutoff, **$1,165,000.**

wid'n. 3.1 mi. from Chuckanut junction to Secondary St. Hy. 1-F, **$655,000.**

wid'n. 8.4 mi. from junction with Hy. 1-F to Whatcom co. line, **$1,830,000.**

● **Washington**—State Hy. Dpt., Olympia,

Pacific Co. — constr. hy. from Megler to Knappton, **$300,000.**

Pierce Co.—constr. hy. from Willow's Corner to State Hy. 1 and repairing Hy. 5-D from Puyallup to Willow's Corner, **$1,647,000;**

imprv. 18.5 mi. Primary State Hy. 5-E from Orting to junction with Hy. 5, **$632,000.**

3.4 mi. hy. from Sumner to King Co. line, **$393,000.**

repairing secondary State Hy. 5-D from Puyallup to King Co. line **$373,000.**

imprv. 2.5 mi. Primary State Hy. 5 east of Sumner **$58,000.**

repairing secondary State Hy. 5-E, Orting to Electron, **$48,000.** O. R. Dinsmore, acting state hy. dir.

● **British Columbia**—Province of British Columbia, Parliament Bldgs., Victoria,

Squamish to Vancouver, hy. **$2,000,000.** H. G. Anderson, Parliament Bldgs., Victoria, engr. CD 3/1/43—ENR 3/4/43.

British Columbia — Province of B. C., Parliament Bldgs., Victoria,

North Vancouver—completing constr. mountain road. Mount Seymour Park. **$325,000.** H. C. Anderson, Parliament Bldgs., Victoria, engr. CD 3/1/43—ENR 3/4/43.

EARTHWORK, WATERWAYS

Fla., Palmetto — Raymond Sellhorn c/o "Sellhorns" Sarasota, private boat basin with apartments over individual slips, 1,800 ft. sheet piling, dredging, paving and dock work with pile. **$350,000.**

Tex., Carrizo Springs — Zavala-Dimmit Counties Water Imprvt. Dist., Carrizo Springs, project abandoned, Nueces River Irrigation and Dam Proj. **$250,000.** CD 7/17/47—ENR 8/7/47.

Va., Virginia Beach — Town, c/o Town Council, reinforcing sea walls along beach. **$200,000.**

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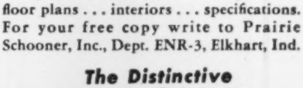

B. C., New Westminster—Municipality, reconstructing retaining wall, Columbia St. **$250,000.** A. Stewardson, city engr.

Ont., Ingersoll — Upper Thames Valley Auth., c/o Watson H. Porter, secy., London, straightening, widening, placing embankments, south branch Thames River. **$600,000.**

●Que., Longueuil — Dominion Govt., Dpt. P. Wks., 5,000 ft. protection wall along St. Lawrence River. **$1,000,000.** R. Blais, c/o owner, engr. CD 8/31/45—ENR 9/6/45.

AIRPORTS AND AIRBASES

Ia., Keokuk — AIRPORT — City, City Hall, airport. **$300,000.** Waxhner Engr. Co., Ames, engr.

Kan., Manhattan — AIRPORT — City, City Hall, airport. **$150,000.** Wilson & Co., 223 N. Santa Fe St., Salina, engrs. CD 12/20 —ENR 12/30.

●Tex., Ft. Worth — AIRPORT IMPRVS. — City, W. O. Jones, mgr Contr. 2, Greater Ft. Worth International Airport, near here, incl. two 200x6400 ft. runways taxiways, and loading apron, near here. **$2,315,000.** C. M. Thelin, dir. P. Wks., City Hall. CD 1/17/45 —ENR 3/22/45.

Newfoundland, Corner Brook—HOUSING—Dominion Govt., Dpt. National Defense (Air), Cartier Sq., Ottawa, Ont., housing units at airport. **$350,000.** Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., engr.

Newfoundland, Freshwater — HOUSING — Dominion Govt. of Canada, Dpt. National Defense (Air), Cartier Sq., Ottawa, Ont., housing units at Placentia Airport. **$300,000.** Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., engr.

Newfoundland, St. Johns—HOUSING—Dominion Govt., Dpt. National Defense (Air), Cartier Sq., Ottawa, Ont., housing units for permanent staff at airport. **$350,000.** Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., engr.

Ont., Downsview—AIR STATION IMPRVS. —Canadian Commercial Corp., 70 Lyon St., Ottawa, remodeling bldgs., steel sphere, 40 ft. diam., vacuum lines, wind tunnels of aerodynamics research laboratory, at Downsview Royal Canadian Air Force Station. Approx. **$250,000.**

●Ont., Hamilton—HOUSING—Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 200 houses at airport, Approx. **$1,400,000.** A. J. E. Smith, c/o owner, engr.

PUBLIC BUILDINGS

Ala., Auburn—Alabama Polytechnic Institute, Auburn, plans by Van Keuren Davis & Co., American Life Bldg., Birmingham, general education bldg. **$500,000.**

Ala., Prichard—Mobile Co., plans by Edward D. Slater, O'Gwynn Bldg., Mobile, Vigor High School addns. **$440,000.** CD 2/15.

Ark., Arkansas City—Desha Co., Arkansas City, plans by Bruce Anderson, Wallace Bldg., Little Rock, erecting Desha County Hospital. **$300,000.**

Calif., Bakersfield—Bd. Supervs., Kern Co., Courthouse, plans by Wright, Metcalf & Parsons, 111 Morgan Bldg., juvenile detention home, **$459,000.**

Calif., Baldwin Park—Baldwin Park School Dist., 173 Hold Ave., plans by Kistner, Curtis, Wright, 816 W. 5 St., Los Angeles, intermediate school, incl. administration and classroom bldgs., laboratory and shop, **$387,000.**

●Calif., Bellflower—Excelsior Union High School Dist., Bellflower, voted $1,300,000 bonds high school between Center St. and Compton Blvd. **$2,600,000.**

Calif., Coachella — Coachella Union High School Dist., Coachella, 17,000 sq. ft. steel, concrete block shop. **$250,000.** Bowen, Rule & Bowen, 2835 Gilroy St., Los Angeles, consult. engrs.

Calif., Chino—Chino School Dist., Chino, voted $600,000 bonds, elementary school, **$320,000;** high school, **$280,000.** CD 6/18—ENR 7/7.

Calif., Costa Mesa—Costa Mesa School Dist., Costa mesa, plans by Kistner, Curtis & Wright, 816 W. 5 St., Los Angeles, primary school. **$265,000.**

Calif., Decoto — Decoto Elementary School Dist., Decoto, plans by Birge M. Clark & Walter Stromquist, 321 Channing Ave., Palo Alto, 13 classroom frame, stucco, school addn., 6 and H Sts., **$280,000.**

Calif., El Cajon — El Cajon Valley Union Elementary School Dist., Ayamaco School addns. **$269,000.**

Calif., El Centro—City, 2 story, 22,000 sq. ft. rein.-con. city hall, **$400,000.** J. F. Golden, 1461 Main St., El Centro, consult. engr.

Calif., Fort Bragg — Ft. Bragg High School and Elementary School Dists., $555,000 bond election Feb. 15, school, **$275,000;** and high school, **$280,000.**

Calif., La Canada—Pasadena City School Dist., 351 S. Hudson Ave., Pasadena, plans by Eugene Weston Jr. and Keith P. Marston, 385 E. Green St., Pasadena, 5 school bldgs. at La Canada Junior High School. **$675,000.**

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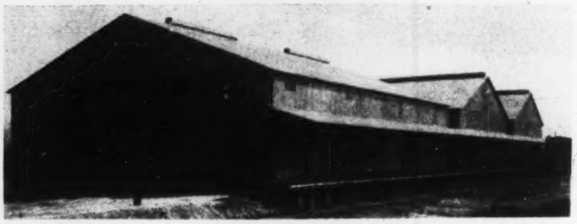

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Calif., Lodi—Lodi Elementary School Dist., Lodi, voted $625,000 bonds Emerson School imprvs. Over **$250,000.** Peter L. Sala, 2130 N. Commerce St., Stockton, archt. CD 1/17.

Calif., Long Beach—City, Bd. Educ., 715 Locust Ave., plans by Victor Seibert, 59 Prospect Ave., King Elementary School addn. **$288,066.** CD 11/18—ENR 12/9.

Calif., Long Beach—Long Beach City Council, City Hall, plans by Francis Hensel, 730 E. 3 St., 1 and part 2 story, 28,000 sq. ft., rein.-con. health center bldg. **$450,000.**

●**Calif., Los Angeles**—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by M. R. Lawson, 2009 W. 7 St., 5 rein.-con. Wilmington Area Junior High School bldgs., Wilmington **$1,250,000.**

Calif., Oakland—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Will G. Corbett & A. W. Anderson, Bank of America Bldg., factory trades bldg. for Training School for Adult Blind, **$400,000.** CD 3/18/43—ENR 4/25/43.

Calif., Santa Rosa—Bellevue Union School Dist., 1987 Redwood Hy. South, plans by Clarence C. Caulkins, Rosenberg Bldg., Santa Rosa, school. **$250,000.** CD 3/13/47—ENR 4/3/47.

Calif., Torrance — Torrance Unified School Dist., Torrance, plans by Daniel, Mann & Johnson, 672 S. LaFayette Park Pl., Los Angeles, Seaside School, 16 classroom, cafeteria, kindergarten. **$400,000.**

Colo., Denver—School Dist. 1, Administration Bldg., Denver, plans by Smith, Hegner & Moore, consult. engrs. and archts., Colorado Bldg., Gilpin School, Thirtieth and Stout Sts. Over **$250,000.**

Colo., Ft. Collins—Colorado A. & M. College, Ft. Collins, plans by Sidney Frazier, Greeley, 2 story, bsmnt., 55x160 ft., steel superstructure, concrete, brick, chemistry bldg. addn. **$250,000.**

Colo., Grand Junction—School Dist. 1, Grand Junction, plans by Atchison & Kloverstrom, engrs. and archts., 1275 Monaco Parkway, Denver, 6 classroom addn. Tope School and 8 room addn. to Columbus School, **$400,000.** CD 6/18—ENR 7/7.

Conn., Bethel—Town, Paul Seiber, chn. Bldg. Comn., brick, steel high school addns., alterations. **$250,000.**

Conn., Bloomfield—Town, J. C. Hoover, chn. School Comn., Bloomfield, plans by Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, brick, steel school, **$250,000.**

Conn., Bristol—City Bristol Housing Auth., Fred O. Zurell, chn., plans by Russell F. Hills, 171 Barker St., Hartford, 70 family units, **$700,000.** C. M. Pfenning, City Hall, engr. CD 11/27—ENR 12/16.

Conn., Bristol—City, Karl A. Reichs, supt. Schools, Bd. Educ., plans by Harold A. Hayden, 175 Main St., 2 story, brick, steel, Mary A. Callen School addn., Pine and Middle Sts. **$250,000.** CD 2/1/45—ENR 2/22/45.

●**Conn., East Hartford**—Town, George E. Slye, chn. School Bldg. Comn., 200 Burnside St., plans by Perkins & Will, 309 W. Jackson St., Chicago, Ill., and John E. Nichols, 7 S. Main St., West Hartford, high school incl., gym and auditorium, **$1,500,000.** CD 8/31/44—ENR 9/21/44.

●**Conn., Meriden**—City, Howard E. Houston, City Hall, 2 school addns., and new elementary school, **$800,000**; brick, steel high school, **$500,000.**

Conn., Hampton — Town, Bd. Selectmen, Town Hall, plans by Henry S. Kelly, 282 York St., New Haven, 2 story, bsmnt., brick, concrete consolidated school, Route 97, **$250,000.**

Conn., Milford—Town, Milford Housing Authority, Milford, plans by Leo F. Caproni, 1221 Chapel St., New Haven, fifty 2 story, bsmnt. garden aprtments, Old Post Rd. **$400,000.**

Conn., Mystic — State, Mystic Oral School, Alan Y. Crouter, supt. Mystic, brick, steel school unit, incl. physical educ. and vocational training, Mystic Oral School. **$800,000.**

Conn., Naugatuck—Town, Supt. Schools, Tuttle School, plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, 2 story, bsmnt., brick, steel school, **$250,000.** CD 10/5/45—ENR 10/18/45.

Conn., Niantic—State Farm for Women, Dpt. Correction, Niantic, 30 bed brick, steel, concrete hospital, State Farm for Women. **$450,000.**

Conn., Norwalk—State Comptroller, State Capitol, Hartford, brick, concrete armory. **$250,000.**

Conn., Stonington—State, Raymond A. Thatcher, comptroller, 114 State Capitol, Hartford, brick, steel armory. **$250,000.**

Conn., Westbrook—State Police Dpt., State Office Bldg., Hartford, police barracks. **$350,000.**

Conn., Woodbridge—Town, Bd. Selectmen, Town Hall, plans by Westcott & Mapes, Inc., 109 Church St., New Haven, 2 story, bsmnt., brick, steel Woodbridge Center School addn. **$250,000.**

Fla., Tampa—City, Curtis Hixon, mayor, Tampa, plans by Robert & Co., 96 Poplar St., Atlanta, Ga., office and storage. **$150,000.**

Ga., Columbus—State Dpt. Agriculture, Capitol Bldg., Atlanta, farmers market. **$250,000.**

Idaho, Nampa—School Bd., Nampa, plans by Whitehouse & Price, Hutton Bldg., Spokane, Wash., 1 story, frame masonry school. **$360,000.** CD 2/4.

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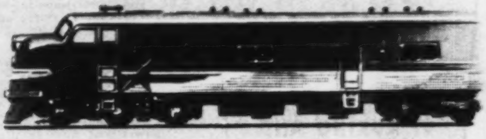
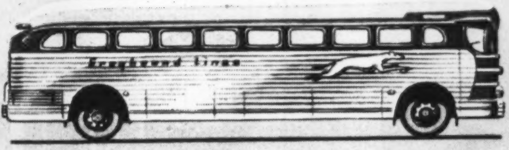
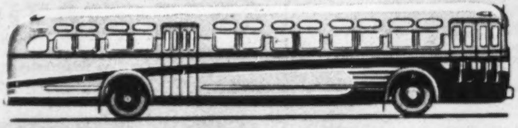
DIESEL LOCOMOTIVES—In 1938, there were 262 mainline Diesel locomotives. In 1948, the number was in excess of 5,000. Seven out of ten Diesel locomotives in passenger service, and three out of four hauling the new fast freights, bear the General Motors nameplate.*

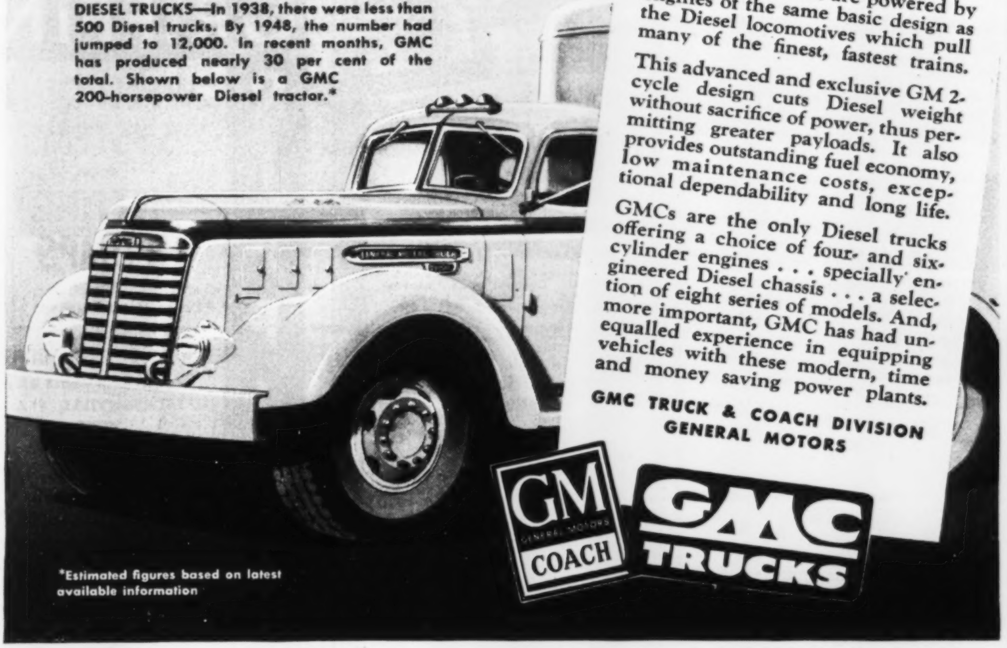






DIESEL COACHES—In 1938, less than 200 Diesel coaches were in operation. By 1948, the number had multiplied to over 18,000. GMC production has accounted for more than 90 per cent of the total. Latest examples of GMC's Diesel coaches are the streamlined Greyhound inter-city coach and the long, low, 55-passenger transit model, shown at left.*

DIESEL TRUCKS—In 1938, there were less than 500 Diesel trucks. By 1948, the number had jumped to 12,000. In recent months, GMC has produced nearly 30 per cent of the total. Shown below is a GMC 200-horsepower Diesel tractor.*



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Ill., Fulton—High School Dist., 306, Fulton, plans by Wm. F. Bernbrock & Assoc., Moline, high school, **$360,000.** CD 2/16/45—ENR 3/22/45.

Ill., Harrisburg—Harrisburg Twp. School Dist., c/o Secy., Harrisburg, brick, concrete, steel vocational bldg., gymnasium. **$485,000.**

Ill., Marion—Marion School Dist. 52., Eugene W. Morrison, pres. School Bd., concrete, brick, stone school **$250,000.**

Ill., Polo—Polo Central High School Dist. 215, voted $300,000 bonds school. **$425,000.** Smith Kratz & Strong, Urbana, archts. CD 4/9/46—ENR 6/13/46.

●**Ind., Anderson**—Bd. P. Wks., G. Lester McDonald, mayor, City Hall, 2½ story, 80x100 ft., brick, steel, rein.-con. municipal power plant, **$1,000,000.** Laramore & Douglas, 327 S. La Salle St., Chicago, engrs.

●**Ind., Evansville**—Bd. School Trustees, 200 N. W. 7 St. plans by Ralph Legeman, 10 Chestnut St., 2 story, bsmnt. Harper School. **$1,000,000.**

Ind., Indianapolis—Bd. Sanitary Engineers, City Hall, 2 story garage. **$260,000.**

Ia., Ames — Bd. Educ., Ames, 2 schools. **$700,000.**

●**Ia., Cedar Falls**—State Bd. Educ., Des Moines, plans by Nemmers, Clark & Spooner, Masonic Temple, Des Moines, women's dormitory, **$800,000,** mens dormitory, **$500,000,** at Iowa State Teachers College.

Ia., Cedar Falls—State Bd. Educ., Des Moines, power and heating plant imprvs., incl. plant addn., boiler, turbo-generator, switchgear, cooling tower, water treatment equip. **$100,000.** Brown Eng. Co., 322 K. P. Bldg., Des Moines, engr.

Ia., Fort Madison—Bd. Educ., Fort Madison, plans by Keffer & Jones, 202 Masonic Temple Bldg., Des Moines, 2 story Jefferson School addn., **$250,000;** 2 story Richardson School addn., **$250,000.**

Ia., Latimer—Consolidated School Dist., Latimer, plans by Wetherell & Harrison, Shops Bldg., Des Moines, school. **$350,000.**

Ia., Ottumwa — Bd. Educ., Ottumwa, Junior High School. **$308,364.**

Kan., Chanute—Neosho Co., Erie, plans by T. W. Williamson & Co., National Bank of Topeka Bldg., Topeka, hospital, **$300,000.** CD 10/22/47—ENR 11/11/47.

Kan., Emporia—Bd. Educ., Emporia, plans by Buck & Lewis, 18 W. 6 St., East Side School. **$300,000.**

Kan., Hugoton—Stevens Co., Hugoton, memorial bldg. and court house combined, **$275,000.**

Kan., Overland Park—Bd. Educ., Overland Park, voted **$278,000** bonds, school, Everett L. Peterson & Conrad J. Curtis, 1103 E. Armor St., Kansas City, Mo., archts. CD 12/27—ENR 1/20.

Kan., Wichita—Bd. Educ., Wichita, plans by Lorentz Schmidt, McVay & Peddie, Wichita, Horace Mann Intermediate School addn. **$350,000.**

Kan., Wichita—Bd. Educ., Wichita, plans by Forsblom & Parks, Beacon Bldg., L'Ouverture School. **$265,000.**

La., Denham Springs — Livingston Parish School Bd., c/o C. N. Durand, archt., Denham Springs, high school, **$350,000.**

La., Houma—State Bd. Educ., Baton Rouge, plans by Wogan, Bernard & de la Vergne, Pere Marquette Bldg., New Orleans, South Louisiana Trade School, **$400,000.**

●**Md., Baltimore**—University of Maryland, Fidelity Bldg., hospital addn. to psychiatric unit. **$1,304,494.**

●**Md., Cheverly**—Bd. Comrs. Prince George Co., Cheverly, hospital addn., heating plant, nurses home, public health bldg., Prince Georges General Hospital. **$1,200,000.**

●**Md., Hagerstown**—Bd. Comrs. Washington Co., Hagerstown, 7 story Washington County Hospital. **$1,250,000.**

Md., Salisbury — Bd. Comrs. Wicomico Co., Court House, Salisbury, Peninsula General Hospital addn., incl. laboratory, X-Ray dpt., business offices. **$650,000.**

Mass., Bedford—Town, School Dpt., plans by 'Adden, Parker, Clinch & Crimp, 177 State St., Boston, school. **$250,000.**

Mass., Boston—City, J. M. Mooney, supt. schools, 26 Norman St., 2 story, bsmnt. school, Readville, **$250,000.**

●**Mass., Boston**—City of Boston Housing Auth., 10 Post Office Sq., Boston, plans by John M. Gray, 175 High St., sixty 2 story frame, 120 unit veterans housing, Cottage and Washington Sts., Hyde Park, **$1,250,000.**

Mass., Boston—City Traffic Dpt., 134 North St., plans by John M. Gray Co., 175 High St., traffic bldg., Southampton and Atkinson Sts. **$400,000.** CD 1/20—ENR 2/17.

Mass., Chelsea — Commonwealth of Mass., P. Bldgs. Comn., 20 Somerset St., Boston, out patient bldg., Soldiers Home. **$350,000.**

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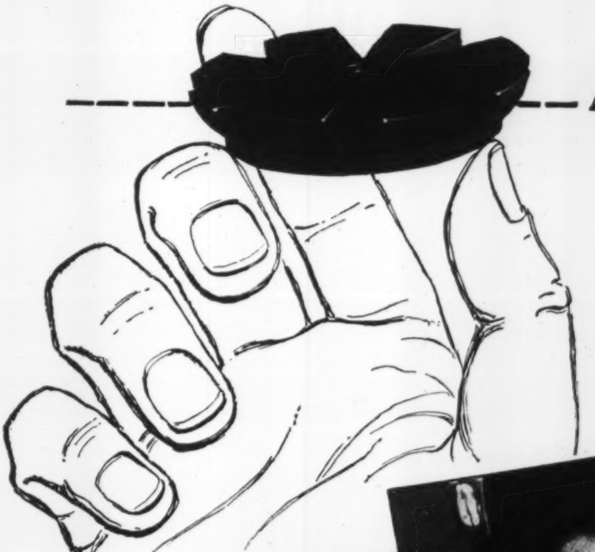

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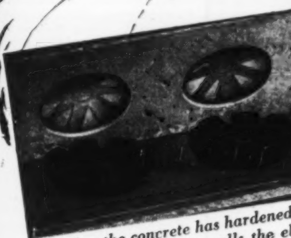
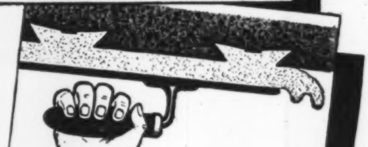


• *After the concrete has hardened, the removal of the forms pulls the elastic Kifs out of the concrete, leaving a clean, undercut cavity or "key."*

• *The form with the Kifs still in place then is ready for re-use for the next pouring shift. After the job is completed, the Kifs are removed by hand.*



• *When the plaster is applied, it squeezes into and fills the key, thus forming a permanent, mechanical bond with the concrete.*

• Kifs cut costs . . . materially as compared with metal lath construction; save time; save plaster; save building height . . . four inches for every story; save capital investment. *They meet all Federal specifications,* as at present advised.

Kifs are rented to contractors on a time basis. For complete information about costs, installation specifications and procedures, write us.

Franchise Service Distributors Wanted:
We invite inquiry from reputable individuals or firms familiar with the building construction field and with the architectural profession who can represent us as leasing agents and service representatives in principal cities.

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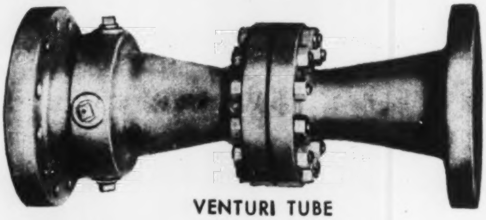
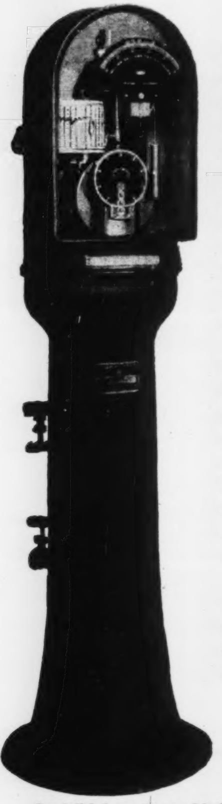


VENTURI TUBE



The correct design and careful workmanship of Simplex Venturi Tubes insure stable coefficients over wide velocity ranges, enabling the accompanying meter to measure flow with extreme accuracy. The high efficiency in the utilization of the differential pressure head is the result of more than 40 years of manufacture and research by this company.

Simplex Type MO Meters, when used in conjunction with Simplex Venturi Tubes as primary devices, guarantee the utmost accuracy in flow measurement over long ranges. They can be furnished to measure accurately over ranges of 20 to 1, 25 to 1, 28.5 to 1 or 32.5 to 1.

Where flow ranges are long, a single meter often will be sufficient where two or more ordinary instruments would otherwise be required.

MO METER

For full information and bulletins, write to the Simplex Valve & Meter Company, 6751 Upland Street, Philadelphia 42, Pa.

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VALVE AND METER COMPANY

●**Mass., Chicopee**—City Housing Auth., Chicopee, plans by Henry J. Tessier & Morris W. Maloney, 220 Dwight St., Springfield, 150 unit housing. **$1,500,000.**

Mass., Clinton—Town Housing Auth., Clinton, plans by Cornelius W. Buckley, 311 Main St., Worcester, 34-36 unit housing. **$350,000.** Charles A. Perkins, 198 High St., site engr. CD 9/28—ENR 10/28.

Mass., Concord—Town, Whittemore Brown, chn. General Bldg. Com., plans by Somes, Griswold, Boyden, Wilde & Ames, 53 State St., Boston, school, Laurel St., **$350,000.**

Mass., East Longmeadow — Town, School Dpt., East Longmeadow, Senior High School, N. Main St. Over **$250,000.**

Mass., Fairhaven — Town, supt. Schools, North Fairhaven, Oxford School addn., North Fairhaven. Over **$250,000.**

●**Mass., Fall River**—City of Fall River Housing Auth., Ray Holmes, Fall River, plans by E. M. Corbett, 49 Purchase St., and S. T. Dubintsky, 41 N. Main St., 196 unit housing Proj. 200-2, South End. **$2,000,000;** 149 units housing, North End, **$1,500,000.**

Mass., Lanesboro — Town, School Dpt., Lanesboro, plans by Harry J. Korslund, 153 Nahatan St., Norwood, consolidated school, Brennans Hill, Over **$250,000.**

●**Mass., Lawrence**—City of Lawrence Housing Auth., John Sirois, exec. dir., City Hall, plans by Pearson Alter & James, 351 Essex St., 256 unit veterans housing, Osgood and Phillips Sts. **$2,921,000.**

Mass., Lincoln—Town, Vincent Nevine, 1669 Lonsdale Ave., brick, steel school. **$250,000.**

Mass., Lynn—City of Lynn Housing Auth., John Cavanaugh, chn., 58 Adams St., plans by Lipinski & Valtz, 113 Market St., veterans housing, Proj. 200-3, Adams St. Over **$250,000.** CD 1/21—ENR 2/17.

Mass., Lynn—City of Lynn Housing Authority, John Cavanaugh, chn., 58 Andrews St., project abandoned, 54 unit, veterans housing, Project No. 200-2, Green and Howard Sts. Lipinski & Valtz, 113 Market St., archts. CD 1/6—ENR 1/20.

Mass., North Attleboro—Town, School Dpt., North Attleboro, John Woodcock School addn., Bank St. and Richards Ave.

Mass., Plainville — Town, Bd. Selectmen, Town Hall, 2 story, bsmnt., brick, steel, concrete school, **$250,000.**

Mass., Quincy—City, School Dpt., 70 Coddington St., plans by Coletti Bros., 687 Boylston St., Boston, school. Over **$250,000.**

Mass., Somerville—City School Dpt., Highland Ave., plans by Wm. L. Gavin, 38 B Brattle St., Cambridge, Pope School, Knapp Elementary School, Prescott School, Burns School, Morse Elementary School, Over **$250,000** each. CD 11/29/46—ENR 12/12/46.

Mass., Stoneham—Town of Stoneham Housing Authority, John Finnegan exec. dir., Town Hall, plans by Drummey, Duffill, Inc., 80 Boylston St., Boston, 48 units, 2 story, bsmnt. veterans housing, Calthea St. **$480,000.** CD 11/11—ENR 11/25.

Mass., Stoughton—Town of Stoughton Housing Auth., Stoughton, plans by August J. Schumacher, 102 Mt. Auburn St., Cambridge, 50 unit veterans housing. **$500,000.**

Mass., Wakefield—Town, Municipal Electric Dpt., Town Hall, plans by Edward M. Bridge, 131 State St., Boston, brick, steel commercial bldg., North Ave. **$250,000.**

Mass., Wakefield—Town, Town Hall, plans by Edward M. Bridge, 131 State St., Boston, 1 and 2 story, 52x101 ft., brick police station, between Centre and Mechanic St. **$250,000.**

Mass., Williamstown—Town of Williamstown School Dpt., F. V. Grant, supt., Williamstown, plans by Morris W. Maloney, 220 Dwight St., Springfield, Vocational-Agricultural School. Over **$250,000.** CD 2/7/46.

Mass., Wollaston (Br. Boston)—City, Supt. Schools, 70 Coddington St., Quincy, plans by Coletti Bros., 687 Boylston St., Boston, school addn. Over **$250,000.**

Mass., Worcester — City, supt. Schools, Worcester, plans by Frank H. Cutting, 29 Pearl St., 2 story, bsmnt., 31x60 ft. and 73x82 ft. gymnasium, school addn., May St. Over **$250,000.**

Mass., Worcester—City Housing Auth., Raymond P. Harold, chn., City Hall, 300 unit housing. **$300,000.**

●†**Mich., Detroit** — National Cancer Hospital of America, Inc., 269 Mack Ave., plans by Derrick & Gamber, 515 Hammond Bldg., cancer hospital. **$10,000,000.**

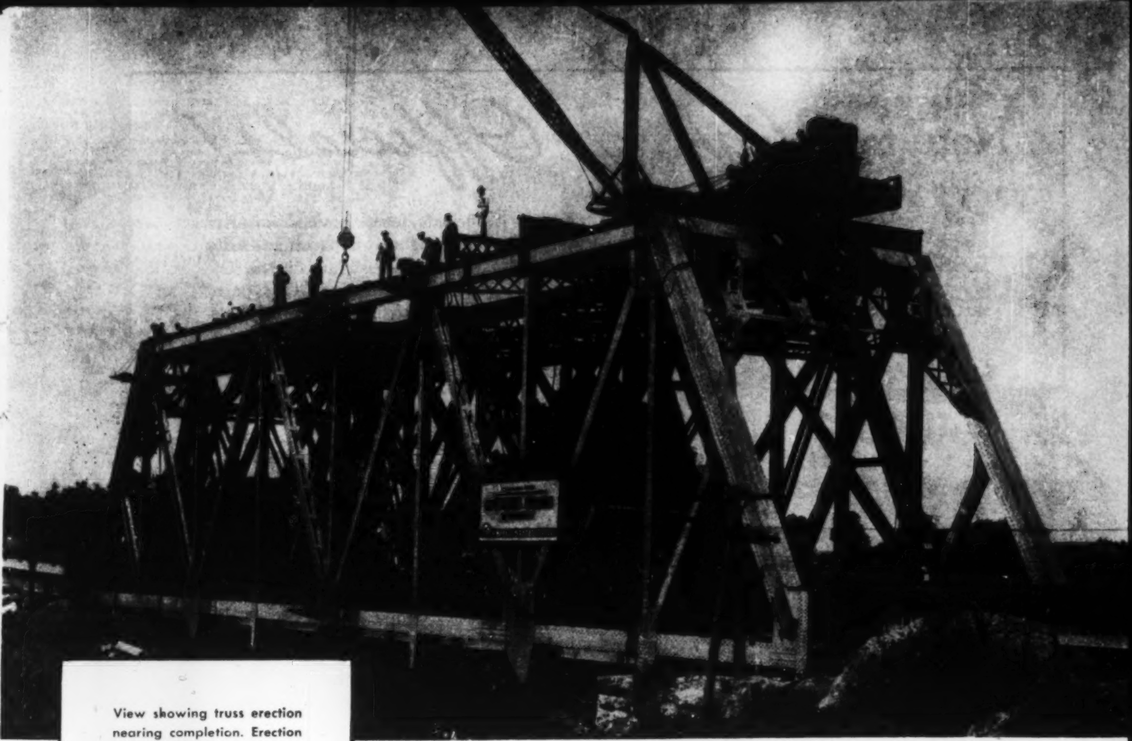
Mich., Lake Orion—Lake Orion Consolidated School Dist., 17-room school. **$480,000.**

Mich., Walled Lake—Walled Lake Consolidated School Dist., Walled Lake, 2 schools, school addns. **$300,000.**

Minn., Grand Rapids — Itasca Co., R. J. Whaling, aud., Grand Rapids, plans by Jyring & Jureness, Hibbing, court house. **$300,000.** CD 2/14/45—ENR 3/8/45.

Minn., South St. Paul—Bd. Educ., T. T. Simley, supt., $1,725,000 bond election Mar. 22, industrial arts bldg., physical education field, high and junior high school alterations, junior high school, **$1,500,000.** Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts.

Mo., Columbia—Bd. Educ., Columbia School Dist., Neil E. Aslin, supt. Schools, Columbia, sketches by Marshall & Brown, 114 W. 10 St.,



View showing truss erection nearing completion. Erection was by locomotive crane and stiffleg derrick. Closure at center, top chord section was made by jacking at near end of trusses.

Bridge designed for Cooper's E-65 loading to current AREA Specifications. Estimated weight 600 tons.

Progress photo showing traffic maintained during erection.

New bridge "swallows" old

Rail traffic was uninterrupted when American Bridge Company erected this 190′ double-track truss span around the old span across the Boyer River near Arion, Iowa.

In addition to designing, fabricating and erecting this and two other nearby bridges for Chicago and North Western Railway Company, American Bridge removed the three old spans.

We cite this project as further evidence that for fabrication and erection efficiently done, you can depend on American Bridge.

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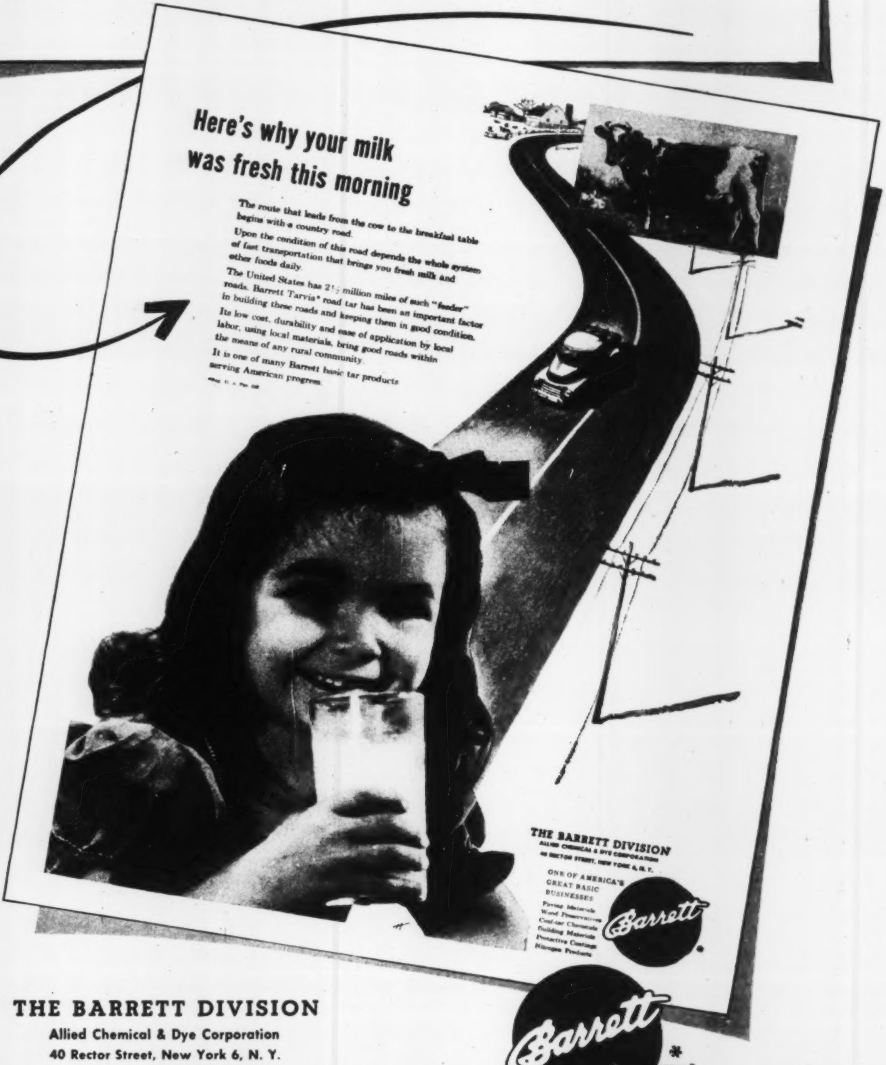
Note to *Highway Officials!*

The advertisement below is reproduced from a recent issue of The Saturday Evening Post. It tells why farm-to-market roads are so vital in America's highway system—helps to "sell" this country on the importance of good all-weather, traffic-safe, feeder roads. Year after year, experienced highway departments write Tarvia* road tar into their plans for the construction and maintenance of this type of road. Ask the Barrett field man for details.



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The route that leads from the cow to the breakfast table begins with a country road.

Upon the condition of this road depends the whole system of fast transportation that brings you fresh milk and other foods daily.

The United States has 2½ million miles of such "feeder" roads. Barrett Tarvia* road tar has been an important factor in building these roads and keeping them in good condition.

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*Reg. U. S. Pat. Off.

Kansas City, brick, concrete, stone, steel school, northwestern part of city. **$250,000-$300,000.** CD 2/4—ENR 2/17.

●**Mo., Independence**—City, Roger C. Sermon, mayor, City Hall, and Chamber of Commerce, Howard Bennett, pres., plans by Robert R. Weatherford, Independence, 2 story, brick, concrete, stone President Truman Memorial Library, Museum and Community Bldg. **$3,500,000.** CD 2/10—ENR 3/3.

●**Mo., Jefferson City**—State, John F. Powell, dir. P. Bldg., State Capitol, Jefferson City, 12 story, bsmnt., concrete, steel office, 2 story L to house cafeteria, auditorium and hearing room. **$3,000,000.** CD 2/17/47—ENR 3/6/47.

Mo., Jefferson City—Lincoln University, Dr. Sherman D. Scruggs, pres., Jefferson City, appropriation asked for Missouri General Assembly, rein.-con., brick, steel, stone law school **$450,000.**

Mo., Kirkwood (St. Louis, Zone 22, P. O.)—Kirkwood School Dist., Bd. Educ., Floyd W. Hendricks, supt. Schools, 702 S. Kirkwood Rd., voted **$330,000** bonds, Oakland School, Lockwood and Sappington Rds. and Robinson school addn., 803 S. Couch Ave. Bonsack & Pearce, Inc., 308 N. 6 St., St. Louis, Zone 1, archt. CD 2/11.

Mont., Red Lodge—Carbon Co., Red Lodge, plans by Cushing & Terrell, 212½ N. Broadway, Billings, 1 story, bsmnt., 44 x 160 ft. and 42 x 57 ft. wings, frame, brick veneer, L-shaped hospital **$285,000.** Reginald T. Hurdle & Son, 816 N. 22 St., Billings, engrs. CD 12/13—ENR 12/23, under Commercial Bldgs.

Neb., Gering—Bd. Educ., Gering, voted bonds, school. **$295,000.** Meginnis & Schaumberg, Federal Securities Bldg., Lincoln, archts. CD 11/4—ENR 12/9.

Neb., McCook—Bd. Educ., McCook, voted bonds, school. **$360,000.** J. W. Radotinsky, Natl. Bank of Kansas Bldg., Kansas City, Kan., archt. CD 12/27—ENR 1/20.

N. J., Mullica Hill—Harrison Twp. Bd. Educ., Mullica Hill, plans by Harold M. Klaisz, 7 N. Maple Ave., Woodbury, school. **$300,000.**

N. Y., Babylon—Union Free School Dist. 7, Babylon, school addn. **$250,000.**

●**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., plans by Shreve, Lamb & Harmon, 11 W. 44 St., Zone 18, 12 story supreme court bldg. on block bounded by Adams, Fulton, Washington and Johnson Sts. **$12,500,000.**

N. Y., New York—New York City Div. of Real Estate, Municipal Bldg., Zone 7, plans by Irving Berg, Grand Central Terminal Bldg., Zone 17, altering houses at 1626 to 1668 Third Ave., **$274,000.**

N. C., Fairmont—Bd. Comrs., Robeson Co. D. G. Kinlaw, clk., Lumberton, bond election Mar. 29, school. **$295,000.** CD 2/11.

N. C., Sanford—Sanford School Bd., M. A. McLeod, supt. Schools, high school group bldgs., incl. gym, vocational shops, school, etc. Over **$250,000.**

●**N. C., Smithfield**—Johnston Co. Memorial Hospital, Smithfield, plans by George Watts Carr, Durham, hospital. **$1,200,000.** CD 9/27—ENR 10/14.

N. D., Minot—State Bd. Higher Educ., Bismarck, plans by S. M. Houkom, 716 7 St. South, Fargo, physical educ. bldg. at State Teachers College. **$260,000.**

O., Akron—Bd. Educ. N. Broad St., plans by Milton Murphy, c/o owner, East High School addn. **$691,000.** CD 12/10/45—ENR 2/14/46.

○**O., Columbus**—Bd. Comrs. Franklin Co., Courthouse, plans by Ralph C. Kempton, 50 W. Broad St., courthouse. **$1,500,000.** CD 11/16/45—ENR 1/3/46.

O., Columbus—Ohio State University, N. High St., plans by Sims, Cornelius & Schooley, 2901 N. High St., 3 story, bsmnt. alternate 4th story, 48 x 152 ft. brick, aluminum electrical engineering bldg. and equip. **$600,000.** Howard Dwight Smith, c/o owner, university archt. CD 11/17/44—ENR 11/30/44.

O., Upper Arlington—Bd. Educ., Upper Arlington, plans by Benham, Richards & Armstrong, 167 E. State St., Columbus, school addn. **$748,000.** CD 11/11—ENR 11/25.

Okla., Alva—Bd. Educ., Alva, high school. **$250,000.** CD 4/4/46.

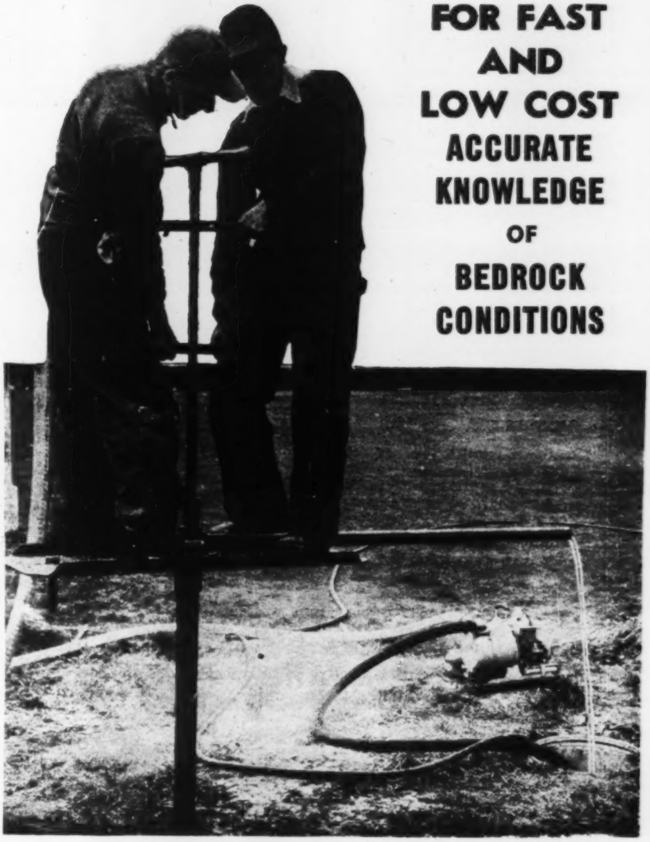
●**Okla., Norman**—Bd. Regents University of Oklahoma, Norman, plans nearing completion by Winkler & Reid, Kerr McGee Bldg., Oklahoma City, memorial library. **$1,000,000.** CD 12/19/46—ENR 2/14/46.

●**Pa., Clarion**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, constructing state hospital for rehabilitation of veterans. **$5,000,000.** A. F. Jones, c/o owner, ch. engr.

Pa., Greenock — Greenock School Dist., Greenock, school. **$293,775.** Wm. J. Finley, State Capitol, Harrisburg, dist. engr. CD 2/27/46—ENR 5/6/46.

●**Pa., Harrisburg**—Dpt. Property & Supplies, 18 and Herr Sts., plans by Lawrie & Green, 321 N. Front St., disturbed patients bldg. at Harrisburg State Hospital. **$1,115,000.** A. J. Jones, c/o owner, ch. engr. CD 3/20/47—ENR 4/3/47.

Pa., Hazleton—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, plans by Lacy, Atherton & Davis, 6 and Maclay Sts., Harrisburg, nurses home addn. at Hazleton State Hospital. **$327,000.** A. F. Jones, c/o owner, ch. engr. CD 1/27—ENR 2/13.



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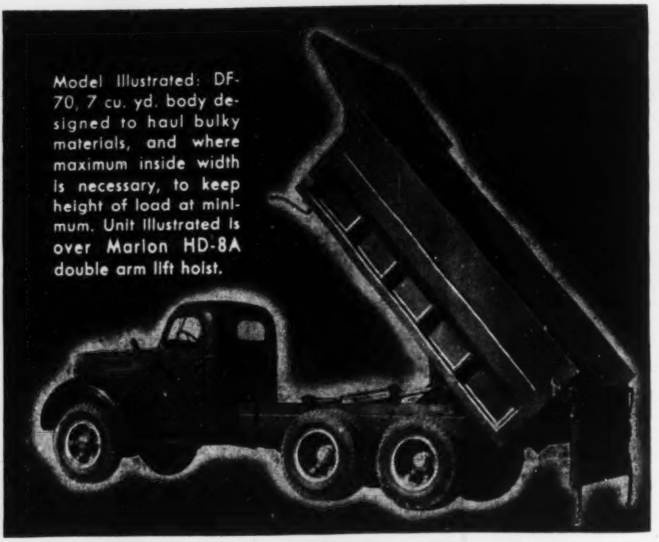

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Pa., Lancaster—Comrs. Lancaster Co., Lancaster, high school. **$325,700.** Wm. J. Finley, State Capitol, Harrisburg, dist. engr.

Pa., Lancaster—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Thaddeus Stevens Trade School addns., imprvs. **$325,000.**

Pa., Muncy—Dpt. Property & Supplies 18 and Herr Sts., Harrisburg, plans by C. J. Lappley, Front and Harris Sts., Harrisburg, industrial bldg. at State Industrial Home for Women. **$275,000.** A. F. Jones, c/o owner, ch. engr. CD 3/29/46—ENR 6/13/46.

●**Pa., Norristown**—Comrs. Montgomery Co., Courthouse, plans by E. Lane Crawford, Norristown Penn Trust Bldg., courthouse addn. **$2,000,000.** Trautwein & Howard, 1411 Walnut St., Phila., assoc. archts. Henry P. Friend, co. engr. CD 7/1—ENR 7/22.

●**Pa., Shamokin**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, addnl. wing to main bldg. of the Shamokin State Hospital. **$1,149,500.** A. F. Jones, c/o owner, ch. engr.

Pa., Waymart—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, plans by George M. D. Lewis, 520 Scranton Life Bldg., Scranton, tuberculosis hospital, at Fairview State Hospital. **$600,000.** A. E. Jones, c/o owner, ch. engr. CD 2/15—ENR 3/3.

R. I., East Providence—Town, C. T. Thompson, supt. 2 five room, brick, steel schools, Riverside and Rumford. **$250,000.**

R. I., Middleton—Town, C. B. Copeland, secy. School Dpt., Middleton, brick, steel school. **$250,000.**

R. I., Richmond—Town, Charles Edmund, chn., Richmond, plans by Monahan & Meikle & Johnson, 255 High St., Pawtucket, 1 story, bsmnt., brick, steel school. **$250,000.**

S. C., Florence—Florence-Darlington TB Sanatorium, c/o Lafaye, Lafaye & Fair, archts., 1226 Sumter St., Columbia, tuberculosis sanatorium. **$600,000.**

Tenn., Nashville—Tennessee National Guard, c/o Adjutant Gen. C. A. Anderson, Nashville, motor vehicle maintenance plant. **$250,000.**

●**Tex., Amarillo** — Amarillo Housing Auth., Amarillo, 800 housing units. Approx. **$4,800,000.** Application filed for PHA funds.

Tex., Anahuac—Chambers Co., c/o Judge, Courthouse, plans by Emory S. White, 625 M & M Bldg., Houston, 1 story, 20 bed masonry hospital. **$275,000.** Walter P. Moore, 4605 Montrose St., Houston, structural engr Howard, Johnson & Kelley, Scanlan Bldg., Houston, mechanical engrs. CD 7/19—ENR 7/29.

●**Tex., Austin**—University of Texas, Austin, plans by Mark Lemmon, 1210½ Main St., Dallas, administration, **$1,500,000**; law school, **$1,500,000**; classroom, **$1,700,000**; 2nd classroom, **$1,275,000**; journalism, **$375,000**; service storage bldg. **$750,000**; pharmacy school, **$1,250,000.** CD 8/16/44—ENR 9/7/44.

Tex., Baytown—Baytown Independent School Dist., Baytown, plans by Herbert Voelcker & Assoc., archt and consult. engrs., 2801 San Jacinto St., Houston, 72x107 ft., cafeteria and 160x170 ft. vocational bldg., brick, stucco, con. slab fdns. **$290,000.**

●**Tex., Beaumont**—Beaumont Housing Auth., 1860 Louisiana St., 700 rental housing units. Approx. **$4,200,000.** Application filed for PHA funds.

●**Tex., Borger**—Borger Housing Auth., Borger 250 low-cost rental housing units, Approx. **$1,500,000.** Application filed for PHA funds.

●**Tex., Brownwood** — Brownwood Housing Auth., Brownwood, 300 low-cost rental housing units. Approx. **$1,800,000.** Application filed for PHA funds.

Tex., Carthage—Carthage Independent School Dist., Carthage, plans by Thomas, Jameson & Merrill, 820 N. Harwood St., Dallas, masonry elementary and high school for negroes. **$325,000.**

●**Tex., Commerce**—East Texas State Teachers College, Commerce, plans by George L. Dahl, 1920½ Main St., Dallas, masonry administration bldg., **$700,000**; masonry library, **$450,000.**

Tex., Crystal City—Crystal City Independent School Dist., Crystal City, plans by Charles Huie, Jr., 1805 Transit Tower, San Antonio, school. **$275 000.**

Tex., Elmendorf—Bexar County Common School Dist. 6, Precinct 4, c/o Clyde E. Smith, supt., 1411 Highland Blvd., San Antonio, plans by J. Fred Buenz, 1517 Majestic Bldg., San Antonio, high school. **$325,000.**

Tex., Fort Worth—Fort Worth Childrens Hospital, 2400 Winton Terrace West, plans by C. O. Chromaster, 408 Century Bldg., hospital bldg. facilities, etc. **$175,000.** CD 5/14/43—ENR 5/20/43.

Tex., Greggton—Bd. Educ., John Schroeder, pres., Greggton, plans by Preston M. Geren, 905 N. P. Anderson Bldg., Fort Worth, Pine Tree High School and Gymnasium. **$300,000.**

Tex., Helotes—Bexar County Common School Dist., c/o Clyde Smith, 1411 Highland Blvd., San Antonio, plans by J. Fred Buenz, 1517 Majestic Bldg., San Antonio, high school. **$300,000.** CD 1/13—ENR 2/3.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., plans by Stayton Nunn, co-ordinating archt., 2017 W. Gay St., masonry, concrete, steel 15 room Garden Villas School addn.; remodeling school. **$300,000.** Marvin Moore, 2008 W. Alabama St., consult. engr. CD 6/23/47—ENR 7/10/47.

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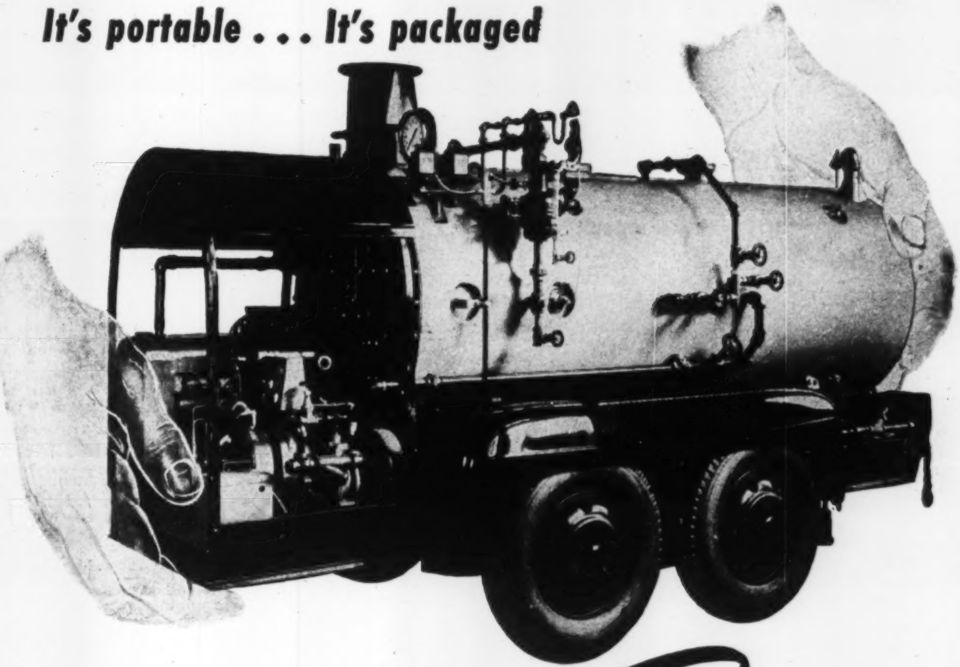

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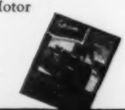

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●**Tex., Houston**—Port Comn., W. F. Peacy, dir., c/o Wharf 13, inbound bulk loading plant, **$1,000,000.** Nelson A. Davis Co., 343 S. Dearborn St., Chicago, Ill., engrs. CD 8/28/47—ENR 9/18/47.

Tex., Liberty — Liberty Courthouse, voted $150,000 bonds hospital unit of 15 addnl. beds. **$250,000.** Gataura, Stromber & Gibson, 513 Scanlan Bldg., Houston, archts. CD 3/6/47—ENR 3/20/47.

Tex., Marlin — Marlin Independent School Dist., plans by Thomas, Jameson & Merrill, 820 N. Harwood St., Dallas, masonry, steel, concrete school; high school and Negro School addns. **$300,000.**

Tex., Seminole—Seminole Independent School Dist., c/o Ted Edwards, supt., Seminole, plans by Wilson & Patterson, 209 Majestic Bldg., Fort Worth, 1 story, brick school. **$400,000.**

Tex., Taft—Civic and Service Clubs, Taft, 25 bed masonry, steel, concrete hospital. **$250,000.**

●**Tex., Wichita Falls**—City and Wichita Co. G. Fairtrace, mgr., plans by Jesse G. Dixon & Ray Arnhold, Wichita Falls, hospital. **$1,200,000.** CD 10/26/45—ENR 11/15/45.

●**Tex., Wichita Falls**—Wichita Falls Housing Auth., Wichita Falls, 500 low-cost rental housing units. Approx. **$3,000,000.** Application filed for PHA funds.

Utah, Brigham City—Boxelder Co. School Bd., Brigham City, plans by Karl L. Krusmark, Brigham City, Central School. **$400,000.** Kenneth Weight, supt. schools.

Va., Leesburg—Loudoun Co., Leesburg, plans by Eubank & Caldwell, Boxley Bldg., Roanoke, high school. Over **$250,000.** CD 8/28/47—ENR 9/18/47.

●**Va., Elko**—State Bd. Health, Richmond, addnl. hospital for Negro tuberculosis patients. **$2,500,000.**

Va., Petersburg—Petersburg Hospital Auth., c/o H. Coleman Baskerville, archt., Central National Bank Bldg., Richmond, hospital. **$800,000.**

●†**Wash., Longview**—Yards & Docks Annex. Navy Dpt., Arlington, Va., 150 x 200 ft. training center **$1,000,000.**

●**Wash., Olympia**—State Capitol Comm., Olympia, office. **$1,250,000.**

Wash., Toppenish—School Bd. Toppenish, plans by W. H. Rothe, 897 W. Yakima Ave., Yakima, high school. **$296,000.** CD 1/31.

Wash., Toppenish — Washington National Guard, Fort Lewis, armory, **$300,000;** ordnance bldg. **$62,000.**

Wash., Yakima—Ahtanum Valley School Dist. 127, Route 7, school. **$420,000.**

Wis., Madison—Bd. Water Comrs., City Hall, plans by H. C. Balch, 16 N. Carroll St., 2 story, 118x169 ft. brick arch. concrete service bldg., concrete fdn. Mead & Hunt, 550 State St., consult. engrs.

Wis., Superior—Bd. Educ., Superior, 2 story school. **$600,000.**

Wis., Wauwatosa—Bd. Educ., Wauwatosa, plans by Ebling, Plunkett & Keymar, 1220 N. Milwaukee St., Milwaukee, Zone 2, Roosevelt School addn. **$300,000.** CD 2/8/45—ENR 2/22/45.

†**Alaska, Anchorage**—Bureau Reclamation, Dpt. Interior, Interior Bldg., 19 and C Sts. N. W., Wash. 25, D. C., lodge **$250,000,** skit hut **$25,000,** toboggan slide **$30,000,** skating hut **$22,500,** offices and residences for employees **$100,000,** airplane landing float **$24,500,** road **$50,000,** in connection with proposed Eklutna hydroelectric proj., near here.

●**Alta., Calgary**—Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., 200 houses, Currie Barracks, 24 St. W. Approx. **$1,200,000.**

●**Alta., Edmonton**—Central Mortgage & Housing Corp., 506 Kensington Bldg., Winnipeg, Man., 500 houses, Approx. **$3,500,000.** H. C. Spence, c/o owner, engr.

Alta., Edmonton—Municipality, pathological and maternity unit addns., to Royal Alexandra Hospital, **$700,000.** J. E. Haddow, city engr.

Alta., Edmonton—Public School Bd., H. G. Turner, secy., Edmonton, school, 114 St. and 76 Ave., Strathcona Pl., Dist., Approx. **$300,000;** school, 125 St. and 116 Ave., Approx. **$250,000;** school, 72 St. and 115 Ave., Approx. **$250,000.**

●**B. C., Colquitz**—Province of B. C., Parliament Bldgs., Victoria, plans by H. Whittaker, Parliament Bldgs., Victoria, hospital, nurses home, farm bldgs. **$4,425,000.**

B. C., Cranbrook—District School Bd., Cranbrook high school **$400,000.** CD 5/7/47—ENR 5/15/47.

●**B. C., Mission** — High School Bd., Mission, plans by C. B. K. Van Norman, 540 Seymour St., Vancouver, Junior Senior High School. **$1,000,000.**

●**B. C., Prince George**—Province of British Columbia, Dpt. P. Wks., Victoria, railroad exten., incl. stations, section houses, water towers, etc. **$8,000,000** appropriated.

●**B. C., Quesnel**—British Columbia Power Comn., Victoria, power plant. **$5,000,000.**

●**B. C., Ruskin**—British Columbia Electric Co., 425 Carrall St., Vancouver, power plant addn. **$2,500,000.** T. Ingledow, 425 Carrall St., Vancouver, engr.

B. C. Squamish — Province of British Columbia, Victoria, lumber assembly plant. **$550,000.**

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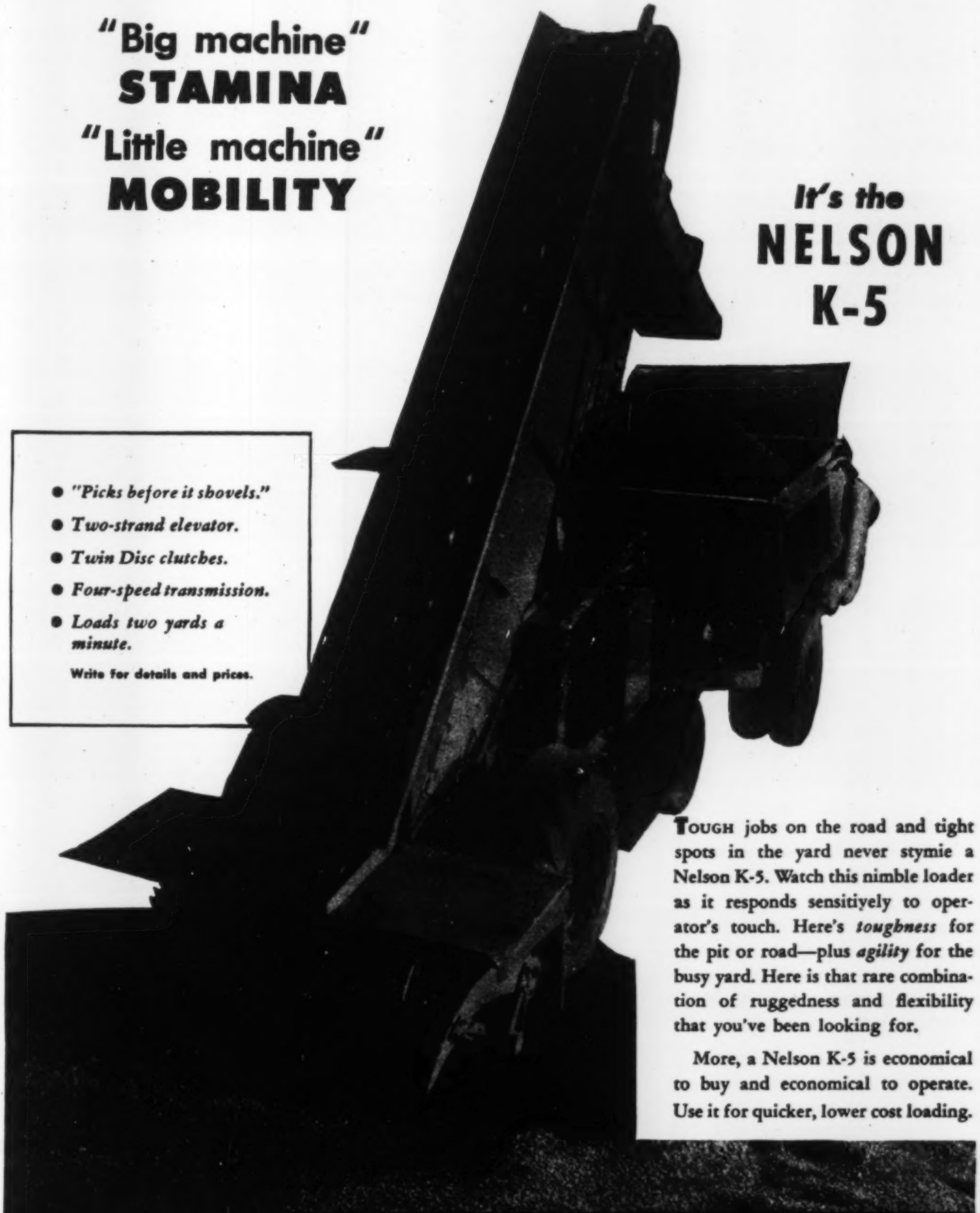

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B. C., Squamish — Province of British Columbia, Parliament Bldg., Victoria, plant to be built in conjunction with Pacific Great Eastern Ry., **$500,000.**

●**B. C., Victoria** — Province of British Columbia, Parliament Bldgs., plans by H. Whittaker, Parliament Bldg., office bldg. **$2,000,000.** CD 6/18—ENR 7/7.

Man., Birtle—School Bd., Birtle, plans by E. Fitz Munn, 1202 McArthur Bldg., Winnipeg, school addn. **$250,000.**

Man., St. Boniface—Municipality, housing development, Niverville St. and Braemar Ave. **$300,000.**

N. B., Grand Falls — Bd. School Trustees, Grand Falls, vocational school. **$300,000.** CD 9/30/43—ENR 10/7/43.

N. B., Saint John—City, H. D. Hopkins, Common Clk., childrens aid station. Approx. **$250,000.**

Newfoundland, Gander — Dominion Govt., Hunter Bldg., Ottawa, Ont., housing for Defense personnel, **$250,000.** Central Mortgage & Housing Corp., 588 Gottengen St., Halifax, N. S., engr.

Newfoundland, Grand Falls—Dominion Govt., Hunter Bldg., Ottawa, Ont., housing for Defense personnel, **$350,000.** Central Mortgage & Housing Corp., 588 Gottingen St., Halifax, N. S., engr.

Ont., Barriefield—Dominion Govt., Dpt. National Defense, Ottawa, dwellings for service personnel, **$350,000.** Canadian Commercial Corp., 70 Lyon St., Ottawa, engrs.

Ont., Brockville—Brockville General Hospital Bd. Governors, W. E. Cook, supt., Brockville, plans by Drever & Smith, 81 Brock St., Kingston, 4 story, 44x175 ft., steel, concrete, hospital wing. Approx. **$500,000.**

Ont., Cornwall—Suburban High School Bd., c/o Leo Martin, secy., plans by H. H. Roberts, Westport, collegiate and vocational school. **$250,900.** CD 5/1/47—ENR 5/15/47.

Ont., Lakeview (Postal Dist. Toronto)—School Bd., Lakeview, plans by Page & Steele, 72 St. Clair Ave. W., Toronto, school. **$250,000.**

Ont., Midland — Pub. School Bd., Midland, plans by J. B. Parkin & Assoc., 648 Church St., Toronto, school. **$250,000.**

Ont., New Toronto (Postal Dist. Toronto)—Province of Ontario, Dpt. Health, Toronto, plans by G. N. Williams, Dpt. P. Wks., Toronto, tubercular patients wing to Ontario Hospital, Lake Shore Rd. **$500,000.**

Ont., Ottawa—Carleton Co., A. Roger, reeve, Court House, plans by Walter Sylvester, 46 Elgin St., court house repairs, alterations, Nicholas St. Approx. **$250,000.**

●**Ont., Ottawa**—Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 400 houses, Gloucester Twp., near Rideau Military Hospital, Hurdmans Bridge. Approx. **$2,500,000.**

Ont., Picton—Dominion Govt., Dpt. National Defense, Ottawa, dwellings for service personnel. **$250,000.** Canadian Commercial Corp., 70 Lyon St., Ottawa, engrs.

Ont., Portage La Prairie — Municipal & Pub. Utility Bd., W. H. Burns, city clk., school to replace Central school. Approx. **$250,000.**

Ont., Seaforth—Hydro Electric Comn. of Ontario, 620 University Ave., Toronto, 110,000 volt transformer station, **$100,000.**

Ont., Strathroy — Hydro Electric Comn. of Ontario, University Ave., Toronto, 110,000 volt transformer station. **$100,000.**

Ont., Streetsville—Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 50 houses. Approx. **$270,000.**

Ont., Thornbury—High School Bd., T. G. Idle, secy., plans by F. W. Warren, 7 Hughson St. S., Hamilton, 1 story, 250x250 ft., concrete, brick high school, Approx. **$300,000.** CD 11/1/45—ENR 12/27/45.

Ont., Orangeville—Bd. Educ., W. C. Hopkins, secy., Orangeville, plans by J. D. Kyles, 78 Ontario Ave., Hamilton, high school. Approx. **$375,000.** CD 2/12—ENR 3/3.

Que., Beaurepaire—Bd. School Comrs., Pointe Claire, plans by L. E. Marshall, Canada Cement Bldg., Montreal, school. **$300,000.**

Que., Coaticook—Province of Que., Minister of Health, Quebec City, hospital, **$350,000.**

Que., Magdalen Island—Province of Quebec, Ministry of Health, Quebec City, hospital. **$400,000.**

Que., Macamic—Province of Quebec, Dpt. Health, Quebec City, sanitorium addn. **$500,000.**

Que., Pointe aux Trembles (Postal Dist. Montreal)—Protestant Central School Comn., 3460 McTavish St., Montreal, plans by H. R. Wiggs, 1411 Crescent St., Montreal, 3 story, 40x64 ft. and 56x110 ft. school addn., Marien Ave. **$325,000.**

Que., Portneux—Province of Quebec, Ministry of Health, Quebec City, hospital, **$300,000.**

Que., Quebec City—Municipality, reconstructing roof, addn. of another story. **$460,000;** wing to City Hall, facing Chauveau Ave., **$240,000.** Ed Hamel, city engr.

●**Que., Quebec City**—Province of Quebec, Ministry of Health, childrens medical center, **$2,000,000.** CD 1/12/45—ENR 1/18/45.

Que., Quebec City—Province of Quebec (Ministry of Mines) Quebec City, voted research laboratories, mineralogy and metallurgy. **$125,000.**

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●Que., Riviere des Prairies (Postal Dist. Montreal)—Province of Quebec, Dpt. Health, Quebec City, hospital for mentally deficient children. **$3,000,000.**

Que., St. Laurent (Postal Dist. Montreal)—Protestant Central School Bd., 3460 McTavish St., Montreal, school addn.

Que., Terrebonne—School Comn., L. Gravel, secy., Terrebonne, plans by Deshaies & Depocas, 3405 Cote des Neiges Rd., Montreal, Approx. **$250,000.** Concrete, steel, brick school and residence.

COMMERCIAL BUILDINGS

Ala., Jasper — First Baptist Church, c/o Charles H. McCauley, Jackson Bldg., Birmingham, church. Over **$250,000.**

Ala., Mobile—Catholic Diocese c/o John J. Carey, archt., First National Bank Annex, St. Catherine School and rectory, **$250,000.**

Ala., Montgomery — Jackson Hospital & Clinic, c/o Raymond Sizemore, 16 S. Hyll St., Montgomery, 150 to 175 bed hospital. Over **$250,000.**

Ariz., Tucson—University Catalina Methodist Church, Tucson, plans by Thomas & Wagoner, 117 S. 17 St., Phila., Pa., church and Sunday school. Over **$250,000.**

●Calif., Broderick—Sam Maci c/o L. Cedric Macabee, engr., 156 University Ave., Palo Alto, 1,600 to 1,800 residences in Todhunter Tract, near here. **$9,600,000.**

●Calif., Los Angeles—Los Angeles Jewish Community Center Assoc., 500 N. Vermont St., community center development east of Fairfield Ave. and Olympic Blvd. **$1,000,000.**

Calif., Oakland — Roman Catholic Archbishop of San Francisco, 1100 Franklin St., San Francisco, St. Cyril's Catholic Church addn., incl. 2 story combination church and parish hall and 2 story rectory. **$300,000.**

Calif., Oakland—Roman Catholic Archbishop of San Francisco, 1100 Franklin St., San Francisco, plans by William S. Schirmer, AIA and William A. Rich, assoc. archt., 1419 Broadway, Oakland, rein.-con. St. Anthony's Parochial School. **$278,000.**

●Calif., Redwood City—Oliver Johnson, 81 Lloyden Dr., Atherton, twenty-two 2 story apartments in Atherwood Sub-division. **$2,000,000.**

●Calif., Salinas—Salinas Valley Memorial Hospital Dist., Salinas, **$2,000,000** bond election Apr. 12, 6 story, rein.-con. 133 bed 105,592 sq. ft. hospital. Robert Stanton, Carmel, archt.

Calif., San Francisco—University of San Francisco, 582 Market St., plans by Milton T. Pfleuger, 580 Market St., 4 story library. **$850,000.** Huber & Knapeck, 1 Montgomery St., engrs. CD 12/10—ENR 12/23.

●Calif., San Mateo—David D. Bohannon Organization, 859 San Mateo St., plans by Angus McSweeney, 415 Mission St., San Francisco, 11 story, Class A rein.-con. apartment. **$1,500,000.** Clarence H. Bazille, 821 Market St., San Francisco, consult. engr.

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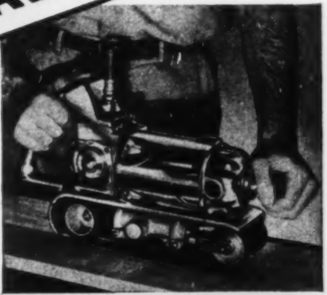

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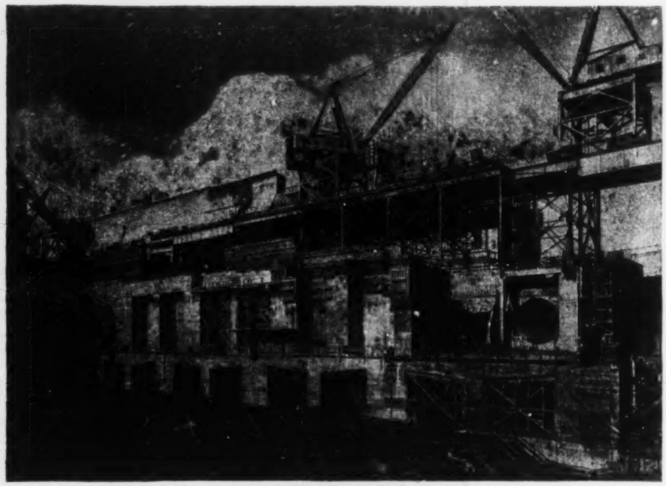

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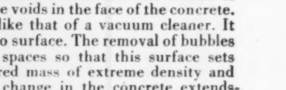

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●**Colo., Colorado Springs**—Owner, c/o Charles D. Strong, engr. and archt., C. A. Johnson Bldg., Denver, rental housing incl. 20 apartments, **$1,500,000.**

Colo., Denver—Loretto Heights College, Albany Hotel, plans by John K. Monroe, consult. engr. and archt., 810 14 St., 1 and 2 story student bldg., known as Machebeuf Hall, incl. dining room, modern kitchen, lounge and snack bar and smaller dining rooms. Over **$250,000.** CD 3/4/48—ENR 3/4/48.

●**Colo., Denver**—University of Denver, Bd. Trustees, University Park Campus, Denver, plans by Charles D. Strong, consult. engr. and archt., 418 C. A. Johnson Bldg., 7 apartments. **$2,000,000.**

Conn., Danbury—Tri-Corner Realty Corp., Joseph Trister, pres., 272 Main St., 2 story, bsmnt., 100x140 ft., brick, steel, concrete, commercial bldg., incl. stores and offices, Main and Elm Sts. **$250,000.**

Conn., Danbury—United Jewish Center, 30 West St., 1 story, bsmnt. brick, stone synagogue, Deer Hill Ave. **$250,000.**

Conn., Deep River—Park Lane Realty Co., Frank Stone, Farmington Ave., 30 acre development, incl. homes, Crystal Beach, Oyster River Splits Property. **$250,000.**

Conn., Hamden—Spring Glen Congregational Church, George A. Riggan, pastor, 19 Spring Glen Terrace, plans by Arland Dirlam, 673 Boyleston St., Boston, Mass., 1 story, bsmnt., brick, stone Church, Whitney Ave. and Glen Parkway. **$300,000.**

Conn., Hartford—Paton Price and S. Capuano, 19 Dean St., Hartford, and Morgan James, Canton, plans by Frank Loyd Wright, c/o owners, brick, stone theater. Over **$250,000.**

Conn., Putnam—Southern New England Telephone Co., 227 Church St., New Haven, plans by Carl Malmfeld & Assoc., 36 Pearl St., Hartford, brick, steel, telephone exchange bldg., dial equip., office, etc., **$250,000.**

Conn., Thompsonville—St. Patrick's Roman Catholic Parish, Rev. W. P. Kilcoyne, pastor, plans by Wendell T. Phillips, 98 Congress St., Millsbury, Mass., 1 story, bsmnt. church, Pearl and High Sts. **$400,000.**

Fla., Miami—R. & M. Corp., c/o Walter R. Shiner, 1115 Cortez St., Coral Gables, office bldg. **$250,000.**

Fla., Pensacola—Baptist Memorial Hospital, c/o Charles H. McCauley, archt., Jackson Bldg., Birmingham, Ala., hospital. Over **$500,000.**

Fla., Tampa—Sisters of St. Joseph, 7 Ave. and Morgan St., plans by Wm. B. Harvard & John D. Dodd, Alhambra Arcade, St. Petersburg, 100-bed St. Joseph Hospital addn. **$500,000.**

Ga., Atlanta—Amco Investment Co., c/o Arthur Neal Robinson, archt., Henry Grady Bldg., 5 story office bldg. addn., alterations. Over **$250,000.**

Ga., Atlanta—Lakemoore Apartments, Inc., c/o A. T. Bradbury, archt., 60 5 St. N. E., apartment development. Over **$250,000.**

Ga., Atlanta—Lutheran Church of The Redeemer, 732 Peachtree St., preliminary plans by Thomas & Wagoner, 117 S. 17 St., Phila., Pa., church, **$350,000.** CD 2/3—ENR 3/4.

Ga., Atlanta—Plantation Pipe Line Co., Healey Bldg., plans by Moscowitz, Willner & Millkey, 1000 Peachtree St. N. E., office. **$400,000.**

Ga., Augusta — Academy-Junior College, Augusta, library. **$250,000.**

Ga., Columbia—Victory Apartments, Inc., c/o James C. Wise, 305 Techwood Dr. N. W., Atlanta, apartment development. Over **$500,000.**

Ga., Macon—Bibb Mfg. Co., c/o Ellamae Ellis League, Grand Bldg., office. **$300,000.**

Ga., Thomson—McDuffie Hospital Assn., c/o Scroggs & Ewings, archts., S.F.C. Bldg., Augusta, hospital, Over **$250,000.**

Ill., Chicago—Congregation Beth Sholom, 1233 Pratt Blvd., plans by B. A. Comm, 1607 Howard St., 3 Story, 50x130 ft., brick synagogue.

●**Ill., Chicago**—Greyhound Corp., 141 W. Jackson Blvd., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., 2 story, bsmnt. Greyhound Terminal, Clark and Randolph Sts., **$7,000,000;** 20 story office on top of bus terminal, **$5,000,000.**

Ill., Chicago—Owner, c/o Frank Lapasso, archt., 8 S. Dearborn St., 80 suite apartment. **$900,000.**

Ill., Evergreen Park — Peace Memorial Church, 1460 W. 78 St., Chicago, plans by Albert F. Heino & Assoc., 7919 S. Ashland Ave., Chicago, hospital, 102 St. Sawyer Ave. **$350,000.**

Ill., LaGrange (P. O. LaGrange)—Nazareth Academy, 200 N. Brainerd St., plans by Thos. J. Higgins & Assoc., 228 N. LaSalle St., Chicago, high school. **$600,000.** CD 1/30/46—ENR 2/14/46.

●**Ill., Niles**—St. Hedwig School & Orphan Home, 7135 N. Harlem St., plans by Leo Sterelka, 1103 Westgate Ave., Oak Park, 4 story brick, steel home for aged. **$2,000,000.**

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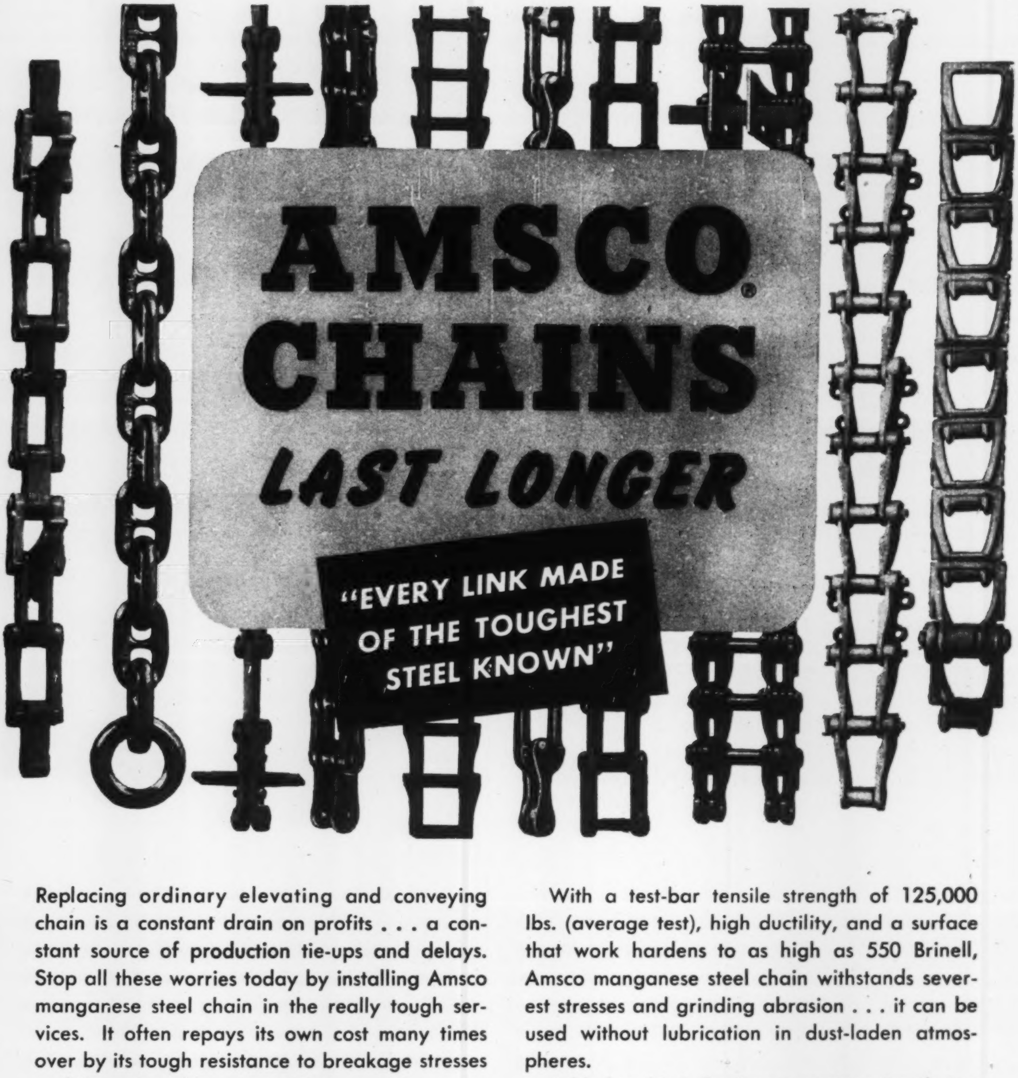

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Ill., Quincy—Vermont St. Methodist Church, 8 and Vermont Sts., plans by Hugo Haeuser, 2051 W. Wisconsin St., Milwaukee, Wis., church, 818 Vermont St., **$350,000.** CD 4/28/47—ENR 5/8/47.

Ind., Fort Wayne—Peoples Trust & Savings Bank, 913 S. Calhun St., Fort Wayne, plans by A. M. Strauss, 415 Cal-Wayne Bldg., Fort Wayne, 1 story, bsmnt., 55x91 ft. stone, brick, rein.-con. chapel, Blessed Sacrament, Lewis and Clinton Sts. **$260,000.**

Ind., Indianapolis — Equitable Life Assurance Society, 393 7 Ave., New York, N. Y., preliminary plans by Skidmore, Owings & Merrill, 100 N. Monroe St., Chicago, Ill. and Robert Frost Daggett, assoc. archt., 350 E. Fall Creek Blvd., North Dr., Indianapolis, 3 or 4 story masonry, department store, Monument Circle, Market to Meridan Sts., **$500,000.** J. C. Penney Co., 330 W. 34 St., New York, N. Y., lessee. CD 10/7—ENR 10/21.

Ind., Terre Haute—Ohio Oil Co., S. Main and Hardin Sts., Findlay, O., plans by Wilbur Watson Assoc., 4614 Prospect Ave., Cleveland, Zone 3, O., 2 story, bsmnt., 48x120 ft., wing, brick, rein.-con. office, Cherry St., between 6 and 7 Sts. **$300,000.**

Ia., Cherokee—Sioux Valley Hospital, Cherokee, plans by Wm. Buettler, Insurance Exchange, Sioux City, hospital. **$330,000.**

Ia., Corning — Rosary Hospital, Corning, plans by Wetherell & Harrison, Shops Bldg., Des Moines, hospital, **$600,000.**

Ia., Des Moines—Iowa Lutheran Hospital, 712 Parnell St., plans by Wetherell & Harrison, Shops Bldg., Des Moines, hospital addn. **$750,000.** CD 7/9/47—ENR 7/31/47.

Kan., Larned—Dominican Sisters, Larned, plans by Cayton & Murray, Abilene, hospital. **$400,000.** CD 10/15/47—ENR 10/23/47.

Ky., Lexington — Lexington Fayette Co. Y. M. C. A., Lexington, plans by Brock & Johnson, 144 Barr St., YMCA bldg., **$500,000.** CD 4/13—ENR 4/29.

Kan., Olathe—Olathe Hospital Foundation, c/o City, City Hall, hospital. **$275,000.**

La., Jennings—Jennings Hotel, c/o Barron & Heinberg, archts., Guaranty Bank Bldg., Alexandria, hotel. Over **$250,000.**

La., Lake Charles—W. L. Paternostra, 225 Broad St., plans by Gabriel & Reames, Roumain Bldg., brick, steel theatre. **$350,000.**

La., New Orleans—St. Alphonses Church, 2030 Constance St., plans by Norman & Nolan & Nolan, Queen Crescent Bldg., 3 story, 80x160 ft., concrete, brick parochial school.

Md., Baltimore—Owner, c/o David Harrison, archt., 421 St. Paul Pl., preliminary plans shopping center, Dolfield Blvd. and Cold Spring Lane, **$750,000.**

Mass., Arlington—St. James Parish, Rev. Maurice O'Connor, D.D., pastor, 15 Appleton Pl., plans by Wm. B. Colleary, 117 Revere St., Boston, parochial school, Acton St. Over **$250,000.**

Mass., Boston—Boston Museum of Science, 189 Chestnut St., plans by Ames Child & Graves, 50 Beacon St., wing to museum, Charles St., near Leachmere Bridge. **$350,000.** Robert M. Becker, 50 Beacon St., structural engr.

Mass., Boston—Massachusetts Eye & Ear Infirmary, 243 Charles St., plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., hospital addns., alterations. **$500,000.**

●**Mass., Boston**—Northeastern University, 360 Huntington Ave., Boston, plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., library, Huntington Ave. **$1,500,000.**

Mass., Brighton — Sutherland Realty Co., Inc., 217 Kent St., Brookline, plans by Saul E. Moffie, 1318 Beacon St., Brookline, 3 story, bsmnt., brick, cast stone apartment, Sutherland and Strathmore Rds. **$250,000.** Edward H. Heenan, 18 Brattle St., Cambridge, consult. engr.

Mass., Danvers — St. Johns Preparatory School, Spring St., plans by Alfred Shaw, 208 S LaSalle St., Chicago, Ill., gymnasium, **$350,000.** CD 2/7/45—ENR 3/22/45.

Mass., Lenox—Our Lady of Mercy Preparatory School, Very Rev. George K. McGee, Society of Fathers of Mercy, Pittsfield, preparatory school. **$250,000.**

Mass., Springfield—Morris Bennett, 62 Osgood St., plans by E. P. Dorgan, 833 Chestnut St., 3 story, bsmnt., brick apartment, School St.; 2 story bsmnt., brick apartment, Mill St. Over **$250,000.**

Mass., Waltham—Brandeis University, G. Alpert, chn. Bd. Trustees, 10 State St., Boston, plans by Archie Riskin, 262 Washington St., mens and womens dormitories alterations, addns. **$300,000.** Mark Linenthal, 16 Lincoln St., Boston, engr.

Mass., Worcester—Young Mens Christian Assn., 766 Main St., plans by Johnson & Rustigian, 390 Main St., 2 story, bsmnt., Greendale Sect. branch of Y.M.C.A., **$250,000.**

Mich., Grand Rapids—Congregation Emanuel, c/o Eric Mendelsohn, archt., 627 Commercial St., San Francisco, Calif., temple, community center. **$300,000.**

●**Mich., Saginaw**—St. Lukes Hospital, Saginaw, plans by Schmidt, Garden & Erickson, 104 S. Michigan Ave., Chicago, Ill., hospital, **$1,800,000.** CD 3/12/47—ENR 4/3/47, under Public Bldgs.

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Minn., St. Paul—St. Joseph Hospital, 69 W. Exchange St., plans by Margulo & Quick, 1004 Marquette Ave., Minneapolis, boiler house, equip. **$250,000.** CD 1/3/47—ENR 1/12/47.

Miss., Greenville — St. Joseph Catholic School, c/o Rev. M. Maloney, Greenville, plans by Wm. R. Burk, Pan American Bldg., New Orleans, La., parochial school. Over **$250,000.**

Miss., Jackson—Owner, c/o E. L. Malvaney, archt., Millsaps Bldg., shopping center, at intersection Terry and Raymond Rds. Over **$250,000.**

Mo., Point Lookout—School of the Ozarks, R. M. Good, pres., Point Lookout, boys dormitory, chapel and hospital. **$500,000.** CD 1/26—ENR 2/10 and CD 1/31. ENR 2/10, under Mo., Hollister.

N. J., Millville—Millville Y.M.C.A., Millville, plans by Walter Custer, Bridgeton, bldg. **$250,000.**

N. Y., Astoria—Brecher-Wahl Realty Corp., c/o Samuel Paul & Assoc., 163-18 Jamaica Ave., Jamaica, 6 story, apartment, 31 Ave. and Crescent St. **$800,000.**

N. Y., Bayside—Jeffrey Garden Apartments, Inc., c/o Samuel Paul Assoc., archts., 163-18 Jamaica Ave., Jamaica, 3 story garden apartments, 47 Ave. and 215 Pl.; 215 Pl., near 47 Ave., westside; 215 Pl. near 47 Ave. eastside 47 Ave. and 215 Pl. **$755,000.**

N. Y., Brooklyn—Congregation B'nai Yechiel Ashkenazi Anshe Sfard, Inc., 320 Brighton Beach Ave., Zone 24, plans by Joseph Saravis, c/o owner, 4 story school, 3096-3104 Brighton 4th St. **$250,000.**

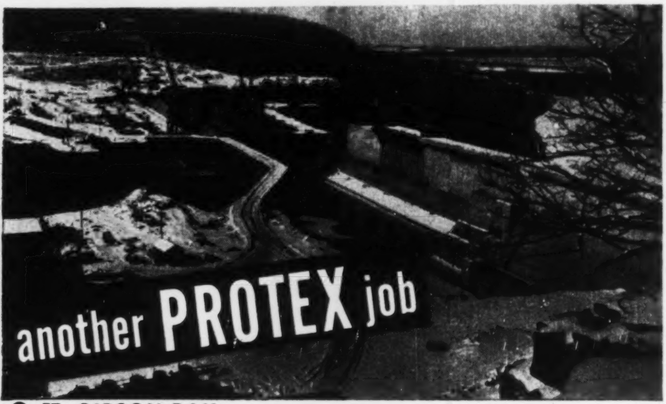
●**N. Y., Brooklyn**—Kingsway Gardens, Inc., 14 Washington Pl., New York, plans by Ingram S. Carner, 1559 E. 28 St., three 6 story apartments, 1 at 2807-21 Kings Hy. **$850,000;** 1 at 2705-21 Kings Hy., **$1,000,000;** and other at 2607-15 Avenue O, **$800,000.**

●**N. J., Fairview (Camden P. O.)**—Markheim-Chalmers & Ludington, Inc., 540 Cooper St., Camden, apartment development, Morgan and 8 Sts. **$2,000,000.**

N. Y., Flushing—Park Flushing Corp., c/o S. Paul & Assoc., archts., 163-18 Jamaica Ave., Jamaica, apartment, Saull St. and Cherry Ave., and Cherry Ave. near Saull St., **$395,000.**

N. Y., Queens Village—R. P. K. Corp., c/o S. Paul & Assoc., archts., 163-19 Jamaica Ave., Jamaica, 3 story apartment, 221 Pl. 90 Ave.; 90 and Braddock Aves.; 90 Ave. and Barkell Pl.; Winchester Blvd. and Barkell Pl. **$690,000.**

N. Y., Rego Park—Eldee Garden Apartments, Inc., c/o Schulman & Soloway, archts., 4 Court Square, Brooklyn, Zone 2, apartment, Woodhaven Blvd. between 62 Rd. and 62 Ave. **$400,000.**



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N. C., Charlotte—Church of the Holy Comforter, T. C. Heywood, chn. Bldg. Com., Rev. Iveson B. Nolan, rector, 1506 S. Blvd., plans by Elbert M. Conover, consult. archt., Phila., Pa., church, rectory, parish house, on 4 acre site, 2600 Avondale Ave. **$500,000.**

●**N. C., Charlotte**—Winston A. Thompson, 141 Brevard Court, Charlotte, Jno. Slawter, Jr., Winston-Salem and J. B. Thomas, 138 Brevard Court, Charlotte, plans by Lyles, Bissett, Carlisle & Wolff, Columbia, 241 units on 28 acre site on east side of Wakefield Dr. **$3,000,000.**

N. C., Fayetteville—E. H. Blackburn, Fayetteville, residential development. Over **$300,000.**

●**N. C., Greensboro**—W. H. Weaver, Greensboro, 176 unit housing (Lindley Park Manor), in Lindley Park area. Over **$1,300,000.** CD 8/15/47—ENR 8/28/47.

N. C., Lumberton—Southern Bell Telephone & Telegraph Co., L. B. Œisenhart, mgr., Lumberton, 2 story, rein.-con., brick bldg. etc., East Fifth and Cedar Sts. **$900,000.**

N. C., Raleigh—Raleigh Apartments, Inc., c/o Alan S. O'Neal, 1020 W. Peace St., housing, six 2 story bldgs., Cameron St. and Smallwood Dr. **$400,000.**

●**N. C., Winston-Salem**—Wake Forest College, c/o Dr. C. C. Warren, chn. Bd. Trustees, 318 N. Tryon St., Charlotte, plans by Jens F. Larson, 331 Madison Ave., New York, N. Y., chapel and auditorium. Over **$1,000,000.** CD 10/21/46—ENR 10/31/46.

Okla., Oklahoma City—Catholic Church, c/o Bishop E. J. McGuiness, c/o C. L. Monnot, archt., 1915 N. Iindiana St., home for elderly Catholic people, N. W. 19 and Portland Sts. **$400,000.**

●**Okla., Oklahoma City**—Lyon Development Co., First Natl. Bldg., plans by Albon W. Davis, Apco Towers, 185 houses development, N. W. 23 and Roff Sts. **$2,000,000.**

Okla., Oklahoma City—Sohio Petroleum Co., 1st Natl. Bank Bldg., plans by Coston & Frankfurt, Apco Tower Bldg., remodeling 12th, 13th and 14th floors of Skirvin Tower Hotel as offices. **$350,000.** CD 11/17—ENR 12/16.

Okla., Oklahoma City—Tradesmens National Bank, Tradesmen Bank Bldg., project abandoned, Tradesmen National Bank Bldg. addns. **$250,000.** Coston & Frankfurt, Apco Tower, archts. CD 6/9/48—ENR 6/17/48.

Okla., Tulsa—Holly Stores, Inc., 222 S. Main St., plans by John Cushing, Marshall Bldg., remodeling Holly Stores, 224 S. Main St. **$185,000.**

Okla., Tulsa—Jacobson Bros., 3649 Terwilleger Blvd., 135 unit ranch type houses, in Ranch Acres. **$250,000.** Mansur & Steele, 1211 S. Frisco St., consult. engrs.

Okla., Tulsa—Otis E. Nidiffer, 1930 S. Knoxville St., plans by George W. King, Tuloma Bldg., 25 single family houses and business sect., 51 and Peoria Sts. **$300,000.**

Ore., Bend—Central Oregon Hospitals Foundation, Bend, plans by J. W. Maloney, Central Bldg., Seattle, Zone 4, 100 bed St. Charles Hospital addn. **$500,000.** CD 11/11/46—ENR 11/21/46.

Pa., Norristown—The Bell Telephone Co. of Penna., 1401 Arch St., Phila., plans by Zantzinger & Borie, 1531 Locust St., Phila., central exchange bldg. **$460,000.** Frank N. Kneas, 504 Woodland Terrace, Phila., consult. engr.

●**Pa., Pittsburgh**—University of Pittsburgh Medical Center, Forbes St., plans by Ingham., Boyd & Pratt, 1211 Empire Bldg., nurses home and training school. **$4,050,000.** CD 1/22/48—ENR 2/19/48.

Pa., Pottstown—The Hill School, Pottstown, plans by W. G. Eccles Co., 223 E. Washington St., New Castle, dormitory. **$300,000.**

Pa., Sewickley—Sewickley Academy, Sewickley, plans by Ingham, Boyd & Pratt, 507 Liberty Ave., Pittsburgh, 3 story, bsmnt., brick private school addn. **$250,000.**

R. I., Johnston—Our Lady of Grace Church, Rev. Dominic Russillo, Johnston, plans by Samuel Morino, 108 Clarendon St., Providence, 1 story, bsmnt., brick, stone church, Waterman Rd. **$250,000.**

R. I., Warwick — St. Mark's Episcopal Church, A. R. Parshley, Arch Deacon, Episcopal Diocese, 101 Benefit St., Providence, plans by Irven F. Goodman, 934 Industrial Trust Bldg., Providence, 1 story, bsmnt., cinder block, stone church-parish house, etc., West Shore Rd. **$250,000.**

●**S. C., Isle of Palms**—The Beach Co., J. C. Long, pres., 88 Broad St., Charleston, 1,000 residential units. **$10,000,000.** CD 11/6/44—ENR 11/16/44.

Tenn., Jackson—Harold Simpson, Jackson, plans by W. C. Harris, Jackson, shopping center. **$250,000-$300,000.**

Tex., Austin — Texas National Hotel Assn., c/o W. L. Moody, Jr., 2028 Market St., Galveston, plans by Atlee B. & Robert M. Ayres, Transit Tower, San Antonio, 3 story, masonry, concrete, steel Austin Hotel addn. **$300,000.**

Tex., Beaumont—First Baptist Church Congregation, 848 Broadway, plans by W. B. Livesay, 325 San Jacinto Life Bldg., 3 story, 92x135 ft., brick concrete educational bldg., concrete fdn., air-conditioning. **$300,000.**

Tex., Bryan—Apartments, Inc., c/o J. C. Culpepper, 1505 S. College Ave., plans by Norton & Mayfield, 1505 S. College Ave., 58 masonry apartment units. **$464,000.**

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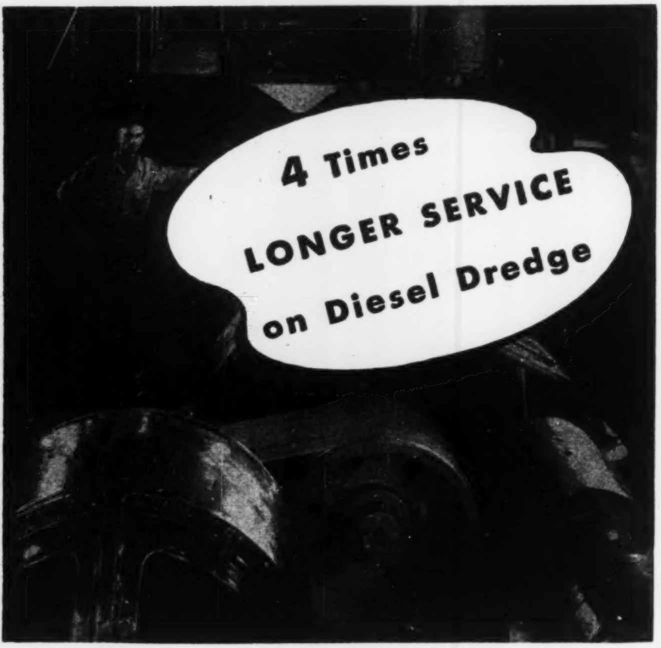

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Tex., College Station—Apartments, Inc., c/o Norton & Mayfield, archts., 1505 S. College Ave., Bryan, 5 masonry apartments. **$250,000.**

●**Tex., Corpus Christi**—Corpus Christi, Inc., c/o Lee Aikin, Airport Rd., 200 housing units, on 44 acre tract between Almeda and Staples St. **$1,000,000.**

●**Tex., Dallas**—Herman Loupot, c/o Westmoreland Village, 203 N. Burnet St., plans by Leinbach Bros., 600½ E. Jefferson St., shopping center, 10 acre plot in Oak Cliff., **$800,000;** commercial units on Fort Worth Hy., **$350,000.** Koch & Fowler, Gr. Natl. Life Bldg., consult. engrs. CD 2/21.

●**Tex., Dallas**—Moody & Tips, 701 Forest Ave. Rd., 2,000 masonry home subdivision development, 400 acre site bounded by Illinois and Morrell Sts. and M. K. T. Ry. line Cedar Crest Golf Club area. **$20,000,000.**

●**Tex., Fort Worth**—Beverly Hills Development Co., c/o P. D. Henry, 209 N. 8 St., plans by Herman G. Cox, 501 N. P. Anderson Bldg., community shopping center in Beverly Hills Addn. off Jacksboro Hy. **$2,000,000.**

Tex., Houston—M. DeGeorge Estate, c/o Ambassador Hotel, 919 Fannin St., plans by Garrison King, 2130 Harold St., 3 story hotel, **$300,000.** CD 1/27—ENR 2/10.

Tex., Houston—H. K. Ferguson Co., M & M Bldg., 3 or more stories, masonry commercial bldg. **$600,000.**

Tex., Houston—H. R. LeMay, 4818 Main St., 50 dwellings. **$425,000.**

Tex., Houston—R. A. McWilliams & Assoc., M. Esperson Bldg., 45 dwellings, Oak Forest sub-division. **$303,750.**

●**Tex., Houston**—Oak Forest Corp., c/o Frank W. Sharp & Assoc., 2202 Rosslyn St., 455 dwellings, in new sect. bordering Oak Forest proper. **$2,750,000.**

●**Tex., Houston**—P. C. Stewart, 5308 Carrolton St., plans by Still, Wildman & Crockett, 3509 Almeda Rd., 400 dwellings, 14 blocks between Askew and Golfcrest Blvd. along Gulf Freeway, Freeway addn., **$3,500,000.**

Tex., Hunt—Synod of Texas of the Presbyterian Church, 909 McKinney St., Houston, synod project, **$250,000.**

Tex., Irving—Lloyd Blalock, Belton St., Dallas, 65 dwellings, Northern Hills sub-division. **$375,000.**

Tex., Laredo — Southwestern Bell Telephone Co., c/o G. Underwood, Laredo, masonry, concrete, steel telephone bldg. **$300,000.**

Tex., Longview—First Baptist Church, Longview, church. **$700,000.**

Tex., Longview—First Methodist Church, Longview, auditorium. **$300,000.**

Tex., Port Lavaca—Calhoun Development Co., Port Lavaca, 60 unit housing on 104 acre site. **$375,000.**

Tex., San Antonio—Riverside Park Baptist Church, 3500 S. Presa St., plans by Will N. Noonan, 720 Travis Bldg., 2 story, 115x759 ft., hollow tile, brick, concrete church, **$400,000.** CD 4/10/46—ENR 5/2/46.

Tex., San Antonio—Sisters of Charity of Incarnate Word, 4107 Broadway, plans by Julian & White, 2901 Transit Tower, 2 story, masonry, concrete high school, concrete fdn., **$275,000;** 2 and 3 story dormitory, **$275,000;** masonry gym.-auditorium, **$250,000;** classroom unit with facilities chapel and convent, **$250,000,** all foregoing Hildebrand Ave. at Mt. Erin, north of Alamo Stadium.

Tex., San Antonio—Thurman Barrett & Assoc., 6109 S. Flores St., addnl. housing, on Southside. **$300,000.**

Tex., Waco—H. E. Butt Grocery Co., Robstown Rd., Corpus Christi, plans by V. D. Phenix, 4601 Montrose Blvd., Houston, grocery **$300,000.** CD 2/21.

Tex., Wichita Falls — Morningside Park Estates, Inc., c/o Paul Thiem, Jr., Wichita Falls, brick veneer dwellings and apartments, concrete slab fdns. **$375,000.**

Va., South Boston — Halifax Community Hospital, c/o Stanhope, S. Johnson, archt., Allied Arts Bldg., Lynchburg, 60 bed hospital. Over **$500,000.**

Wash., Pasco—Our Lady of Lourdes Hospital, Pasco, plans by J. W. Maloney, Central Bldg., Seattle, Zone 4, 47x260 ft., rein.-con. hospital addn. **$970,820.** CD 2/10.

●**Wash., Seattle**—F. R. McAbee & V. O. Stringfellow, 921 Elliott Ave. W., plans by Thomas Grainger & Thomas, Arcade Bldg., Seattle, Zone 1, 2 and 3 story apartment, Seaview Apartments, **$1,000,000.**

Wash., Seattle—Park Terrace, Inc., c/o R. O. Hagen, 10000 Lake Shore Blvd., plans by F. J. Rogers, 166 Roy St., 3½ story, 125x206 ft. masonry apartment. **$500,000.**

Wash., Spokane—Pacific Telephone & Telegraph Co., Telephone Bldg., Seattle, Zone 4, plans by Jones & Bindon, Hoge Bldg., Seattle, Zone 4, 3 story, bsmnt., telephone bldg. addn. **$670,000.** CD 1/21—ENR 2/10.

Wash., Vancouver—Seattle First National Bank, 2 and Cherry Sts., Seattle, Zone 4, plans by McClelland & Osterman, Skinner Bldg., Seattle, Zone 1, 100x100 ft. masonry branch bank. **$350,000.** CD 7/9—ENR 7/22.

W. Va., Whiteville—Raleigh-Boone Hospital Assn., c/o Vacellio & Kreps, archts., Odd Fellows Bldg., Charleston, 100 bed hospital. Over **$750,000.**

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Wyo., Casper—Parish of St. Anthony's, Rev. Thomas F. O'Reilly, Casper, plans by Leon C. Goodrich & Jan. W. Wilking, engrs. and archts., 226 E. 2 St., parochial school remodeling and addns. $250,000.

Alta., Edmonton—John Schadeck, 10410 135 St., twenty-one 1½ story, 26x32 ft. concrete, frame dwellings, 92 Ave. **$260,000.**

●**B. C., Vancouver**—British Pacific Properties, Ltd., Vancouver, plans by C. B. K. Van Norman, 540 Seymour St., shopping center. **$1,000,000.**

Man., Brandon—S. A. Magnacca, Brandon, 95 dwellings. **$600,000.**

N. B., Bathurst—James Hamet Dunn Hospital Bd., Bathurst, 50-bed hospital addn., **$250,000**; heating plant, **$50,000.**

N. B., Fredericton—Victoria Hospital Bd., Fredericton, hospital wing **$175,000**, nurses home **$450,000**, power house and laundry **$175,000.**

●**N. S., Halifax**—Maritime Telegraph & Telephone Co., 8892 Hollis St., Halifax, bldgs., facilities. Over **$1,000,000.**

Ont., Bronte—Owner, c/o G. Bazeley, archt., 193 Forest Hill Rd., Toronto, 100 houses, Lakeshore Rd. Approx. **$375,000.**

Ont., Haileybury — Reverend Sisters of Mercy, Haileybury, plans by C. C. Woods, 12 E. Richmond St., Toronto, concrete, steel, brick addn. to St. Marys Sanitorium, **$376,000.** CD 10/12/45—ENR 10/25/45.

Ont., Hamilton—Y. M. C. A., 79 James St., plans by W. R. Souter & Assoc., 36 James St., 3 story, 60x100 ft., rein.-con. steel, brick Y. M. C. A. addn., swimming pool. **$300,000.**

Ont., Hearst—Roman Catholic Diocese of Hearst, Hearst, plans by H. S. Labelle, 3 Kelvin Ave., Outremont, cathedral church, **$500,000.**

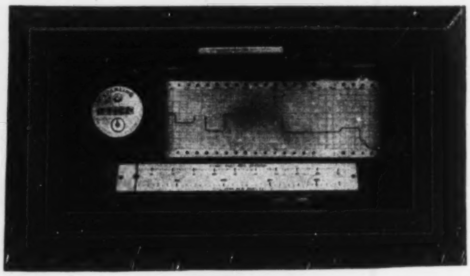
Ont., Orillia—Soldiers Memorial Hospital, P. Copeland, chn. Bd., Orillia, plans by J. E. Smith, 163 Wicksteed Ave., Toronto, hospital units. Approx. **$250,000.**

Ont., Port Arthur—Medical Arts Bldg., Inc., c/o Dr. H. Chipman, 120 High St., plans by McIntosh & Assoc., 118 Syndicate Ave., Fort William, medical center bldg. **$250,000.**

Ont., Port Hope—Trinity College School, Port Hope, Rev. P. A. Ketchum, pres., plans by Mathers & Haldenby, 15 St., Mary St., Toronto, memorial chapel. Approx. **$250,000.** CD 5/17—ENR 6/3.

Que., Drummondville—Reverend Sisters of The Grey Nuns, Drummondville, St. Croix Hospital addn. Over **$500,000.**

SPARLING MAIN-LINE METERS



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Que., Hauterive (Postal Dist. Comeau Bay)—Roman Catholic Liocese of Gulf of the St. Lawrence, Comeau Bay, cathedral church. **$300,000.**

●**Que., Montreal**—Memorial Concert Hall Com., c/o Dr. J. E. Lapierre, concrete hall, 300x300 ft. site, Park Ave. **$3,000,000.**

Que., Montreal—Owner, c/o S. Gerson, 1261 St. Alexander St., rein.-con. brick, stone apartment. **$350,000.** J. Stober, 1261 St. Alexander St., engr.

●**Que., Quebec City**—Roman Catholic School Comn., Quebec City, plans by Germain Chabot, c/o owner, 2 story, 55x120 ft., concrete, brick, stone school for Notre Dame of Pity Parish, **$250,000;** plans by Leo Turcotte, 308 St. John St., 3 story, 60x242 ft., concrete, brick, stone school for St. Albert le Grand Parish, **$460,000;** plans by Aurele Bigonesel, 52 St. Louis St., 100x213 ft., concrete, brick, stone school for St. John the Baptist Parish D'Aiguillon St. **$367,500.**

Que., Sherbrooke—Roman Catholic Diocese of Sherbrooke, 54 Convent St., Sherbrooke, cathedral, Marquette St. **$500,000.**

Que., Val d'Or — Reverend Filles de la Sagersie, Val d'Or, St. Sauveur hospital addn. Over **$350,000.**

Que., Westmount—Unity Boy's Club, 1225 Greene Ave., plans by Archibald & Assoc., 1440 W. St. Catherines St., Montreal, gymnasium. **$175,000.**

Sask., Saskatoon—St. Pauls Hospital, Saskatoon, hospital addn. Approx. **$350,000.**

INDUSTRIAL BUILDINGS

●**Ala., Mobile** — PLANT — Hollingsworth & Whitney Co., Magazine Point, plant addn. Over **$100,000.**

Calif., Fresno—WAREHOUSE, etc.—Dallman Co. of Fresno, 3480 Railroad Ave., 40,000 sq. ft. warehouse and office and outdoor storage facilities. **$300,000.**

●**Calif., Mendota**—SUBSTATION—Pacific Gas & Electric Co., 245 Market St., San Francisco, Panoche substation, near here. **$3,157,000.**

Calif., Redwood City—PLANT, etc.—Union Oil Co. of California, 425 First St., San Francisco, petroleum products distr. plant and temporary wharf. **$125,000.**

Calif., San Bernardino—BAKERY—Barbara Ann Baking Co., plans by Bennett & Bennett, 1165 E. Colorado St., Pasadena, 1 and part 2 story, rein.-con. bakery addn. **$200,000.**

●**Calif., San Francisco**—GAS TANK—Pacific Gas & Electric Co., 245 Market St., gas tank, 23 St. and Pennsylvania Ave. **$2,191,375.**

Colo., Denver—MARKET—Growers Public Market Assn., Frank A. Ciancio, pres., Denargo Market, 29 and Broadway, plans by Roland L. Linder, 507 Insurance Bldg., Denargo Market imprvs., incl. converting 80 stalls into storage space and store rooms for rental purposes, 29 and Broadway. **$250,000.**

Ga., Chamblee—PLANT—American Hospital Supply Corp., 199 Marietta St., Atlanta, mfg. plant. **$250,000.**

Ill., Chicago — WAREHOUSE, etc. — Fairbanks Morse & Co., State St. and 16 St., plans by Epstein & Sons Co., 2011 W. Pershing Rd., 1 story warehouse and showroom. **$300,000.**

Ill., Chicago—PLANT—Illinois Packing Co., 911 W. 37 Pl., plans by N. K. Ball, 800 S. Cuyler Ave., Oak Park, and Shaw, Metz & Dolio, 208 S. LaSalle St., 1 story, brick, steel plant addn. **$200,000.**

Ill., Chicago—PLANT—Naylor Pipe Co., 1230 E. 92 St., 1 story, brick, steel plant. **$130,000.**

Ill., Chicago—PLANT—S. & C. Electric Co., 4435 N. Ravenswood Ave., 1 story plant, 6435 Ridge Rd. **$168,000.** Engineering Systems, Inc., 221 N. LaSalle St., engr.

Ill., Chicago — PLANT — E. H. Sargent & Co., 155 E. Superior St., plans by Olsen & Urbain, 5 S. Wabash Ave., plant, **$800,000.**

Ill., West Chicago—PLANTS—Northwestern Chemical Co., 400 N. Michigan Ave., Chicago, 1 and 3 story, three chemical plant structures. **$500,000.**

●**Ind., Fort Wayne**—TERMINAL and YARD FACILITIES, etc.—New York, Chicago & St. Louis R. R. Co., H. F. Whitmore, ch. engr., Terminal Tower, Cleveland 1, O., relocation, expansion terminal and yard facilities, new engineer terminal, repair facilities and addnl. tracks on 50 acre site, 4 mi. east of here, incl. 90x130 ft. engineer house, 110 ft. turntable, sand house, yard office and locker bldg., water facilities, coal dock cinder conveyer, car repair facilities, etc. **$2,000,000.**

Ia., Maquoketa—CREAMERY—Farmers Union Co-operative Creamery Co., Maquoketa, Buckhorn Creamery. **$100,000.**

Kan., Kansas City—WAREHOUSE—General Motors Coach Div., General Motors Corp., 2540 McGee St., plans by C. E. Keyser, 609 Minnesota Ave., warehouse. **$150,000.**

Ky., Hazard—PLANT—East Kentucky Coal Cleaning Corp., c/o R. B. Bunton, Hazard, coal cleaning plant. **$100,000.**

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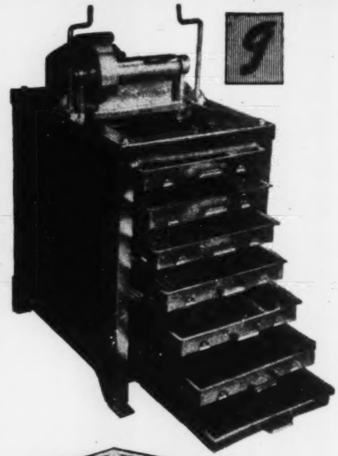

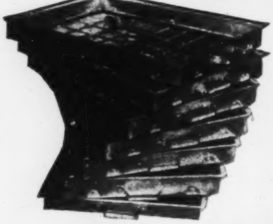

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●**Ky., Pineville** — GENERATING PLANT — Kentucky Utilities, First Natonal Bank Bldg., Lexington, 30,000 kw. generating plant, **$5,000,000.**

La., DeRidder—WAREHOUSE, etc.—Beauregard Parish Electric Co-operative, De Ridder, warehouse and offices, **$116,000.** George C. Hengy & Co., 1007½ Texas Ave., Shreveport, engrs.

La., Manchester (near Lake Charles)—MILL—Farmers Rice Milling Co., Inc., Manchester, reconstructing rice mill, **$125,000.**

Mich., Detroit—PARKING BLDG.—J. L. Hudson Co., 1206 Woodward St., plans by Smith, Hinchman & Grylls, 800 Marquette Bldg., 4 story parking bldg., to cover one city block, 14 store units, ground floor.

●**Mich., Detroit**—PLANT—McCarthy International Tubing Corp., 6837 Wyoming St., plant, **$3,000,000.**

Minn., Minneapolis—SALES and SERVICE—Grossman Chevrolet Co., 1304 E. Lake St., plans by Libenberg & Kaplan, 51 S. 13 St., 1 and 2 story, 127x148 ft. sales and service bldg. **$100,000.**

Mo., St. Louis—WAREHOUSE, etc.—Minneapolis-Honeywell Regulator Co., 4030 Chouteau Ave., Zone 10, plans by Wm. B. Ittner, Inc., 408 Bd. Educ., Bldg., 911 Locust St., Zone 1, 1 story, 69x96 ft., brick, concrete warehouse and office, air-conditioning, 4354 Olive St.

●**Mo., St. Louis County** — PLANT — Carter Carburetor Corp., 2840 N. Spring Ave., St. Louis, Zone 7, rein.-con. brick, steel plant, on 28 acre site, outside city limits of Olivette, incl. parking lot, recreational facilities, landscaping, etc., **$1,000,000.**

Mont., Kalispel—PLANT—Central Heating Co., Kalispel, central heating plant and equip. **$500,000.**

Neb., Lincoln — PLANT — Lincoln Journal, 900 P St., plans by Davis & Wilson, 225 Stuart Bldg., Lincoln, newspaper plant, **$250,000.**

Neb., Omaha—SUBSTATION—Omaha Public Power Dist., 17 and Harney Sts., substation, 19 and Center Sts. **$150,000.** C. W. Minard, c/o owner, ch. engr.

N. Y., Brooklyn—GARAGE, etc.—Nost-Mont Garage, Inc., 361 Broadway, New York, Zone 13, plans by Kitzler & Nurick, 66 Court St., Zone 2, garage and store bldg. alterations, 956-78 Nostrand Ave. **$100,000.**

N. Y., New York—LOFTS, etc.—Grosfeld House, Inc., 320 E. 47 St., Zone 17, plans by Eugene Schoen & Sons, 19 E. 53 St., Zone 22, lofts and showroom bldg. 215-19, E. 58 St. **$250,000.**

N. D., Minot—GARAGE—Westlie Motor Co., Minot, plans by G. H. Bugenhagen, Minot, garage. **$160,000.**

●**O., Brooklyn (Sta. Cleveland)**—PARTS—Cleveland Diesel Engine Div., General Motors Corp., 2106 W. 106 St., Cleveland, 150,000 sq. ft. service parts bldg. near No. 3 Plant. **$2,000,000.**

O., Columbus—FACTORY—Columbus Plastic Products, Inc., 1625 W. Mound St., factory addn., west of present structure. **$50,000.**

Pa., Altoona—MANUFACTURING—Altoona Enterprises, Inc., c/o Chamber of Commerce, Commerce Bldg., plans by Hunter, Caldwell & Campbell, 3601 5 Ave., 1 story, 160x320 ft., steel, brick on concrete back up mfg. bldg. **$200,000.** Blair Shirt Co., 14 Logan Bldg., lessee.

Pa., Brackenridge—BLOOMING MILL—Alleghany Ludlum Steel Co., Oliver Bldg., Pittsburg, brick, concrete, metal siding, steel blooming mill addns., alterations. **$150,000.**

●**Pa., Bristol** — PLANT — Kaiser-Fleetwings, Inc., Bristol, porcelain enameling plant **$2,160,000;** main factory bldg. addn. for mfg. bathroom and kitchen fixtures, **$2,000,000.** CD 10/6—ENR 10/28.

Pa., Collegeville—HEATING PLANT—Ursinus College, Collegeville, central heating plant sys., bldg., piping, etc. Over **$100,000.**

●**Pa., Lancaster** — RESEARCH LABORATORY — Armstrong Cork Co., Liberty and Mary Sts., plans completed by Shreve, Lamb & Harmon Assoc., 11 E. 44 St., New York, N. Y., research laboratory. **$3,500,000.** CD 2/26/48—ENR 3/4/48, under LB.

Pa., Phila.—STORE HOUSE—Pennsylvania R. R., L. P. Struble, ch. engr. (Eastern Region) Broad St. Station Bldg., 1617 Pennsylvania Blvd., Zone 4, plans by George Wharton Pepper, Jr., Lewis Tower Bldg., store house, 30 St. Station. **$200,000.**

Pa., Phila.—RAILWAY EXPRESS and STATION SERVICE—Pennsylvania R. R., L. P. Struble, ch. engr. (Eastern Region) Broad Street Station Bldg., 1617 Pennsylvania Blvd., Zone 4, railway express bldg., and station service bldg., at 30th Street Station. Over **$250,000** each.

●**Pa., Phila.**—REFINERY, etc.—Socony Vacuum Oil Co., Inc., 58 St. and Schuylkill River, refinery addn. and storage facilities. **$18,000,000.**

R. I., Providence — FACTORY — Friendship Realty Co., c/o DiMitri & DiMitri, archts., 17 Exchange St., 3 story, brick, steel factory, Friendship St. **$100,000.**

R. I., Providence—PLANT—Meldon Store Fixtures Co., Inc., 314 Blackstone St., 2 story, 15,500 sq. ft. cinderblock plant and various stores, Washington, Westminister and Lafayette Sts. **$100,000.**

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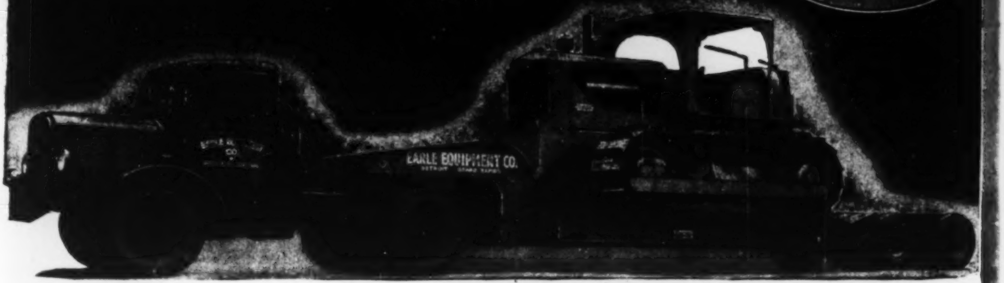

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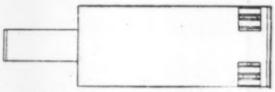

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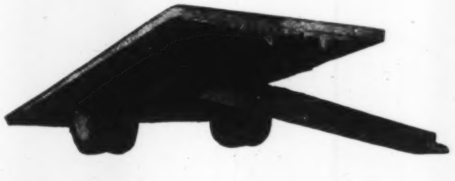

A-7 7,500 lb. A-15 15,000 lb. A-20 20,000 lb.

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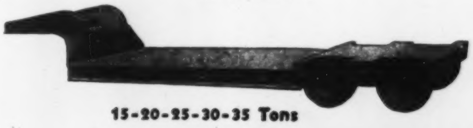

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Tenn., Fayetteville—PLANT—Kraft Foods Co., 500 N. Peshtigo St., Chicago, Ill., mfg. plant. **$300,000.**

Tex., Dallas—SHOP, etc.—W. R. Fine Galleries, 1818 Main St., plans by Everett V. Welch, Construction Bldg., art service, shop, display **$100,000.**

Tex., Dallas—SERVICE SHOP, etc.—Marlin Assoc., 2401 Main St., appliance service shop and warehouse. **$200,000.**

Tex., Dallas—WAREHOUSE—Southern Express, Inc., c/o Cornish, ex. vice pres., 3131 Oak Lane, plans by Herman G. Cox, 501 N. P. Anderson Bldg., Fort Worth, 1 story, 36,000 sq ft. concrete, tilt-up walls, steel deck warehouse, Driven Ave. **$250,000.**

●**Tex., Grand Saline** — PLANT — Morton Salt Co., c/o J. Y. Bell, mgr., Grand Saline, plant bldgs., incl. exploration plant, addns. to existing bldgs. at site of Morton's Kleer Mine, outside city limits. **$2,250,000.** H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., consult. engr.

Tex., Grand Saline — PACKING PLANT — Morton Salt Co., Grand Saline, project abandoned reconstructing portion packing plant. **$200,000.** CD 11/4—ENR 11/18.

Tex., Houston—WAREHOUSE—M.De George Estate, c/o Ambassador Hotel, 919 Fannin St. plans by Garrison King, 2130 Harold St., warehouse. **$150,000.** CD 2/23

Tex., Houston — PLANT — Houston Pipe & Steel, Inc., 4300 Calhoun Rd., remodeling (war) plant into modern plant for industrial usage. **$250,000.**

Tex., Houston — INDUSTRIAL—Jarecki Mfg. Co., 5920 Navigation Bldg., plans by G. Ancira, Scanlan Bldg., 2 story, 40 x 111 ft. masonry type industrial bldg., oil field shop and supplies. **$175,000.**

Tex., Houston—CANNERY—Oceanic Foods, c/o C. W. Edwards, 1009 Jackson St., tuna-fish cannery, 150 tons daily cannery capacity, freezing units for 1,000 tons at a time. **$600,000.**

Tex., Houston—PLANT—Standard Roofing Co., c/o W. H. Marshall pres., 4910 Navigation Blvd., 25,600 sq. ft. plant, 5500 Blk Armour Dr. in Clinton-Lockwood Industrial Dist. **$100,000.**

Tex., San Antonio — PLANT — San Antonio Chili Canners, 422 Chestnut St., 25,000 sq. ft. floor space chili canning plant. **$100,000.**

Tex., San Antonio—LABORATORY, etc.—Southwest Research Institute, c/o Tom Slick, Milam Bldg., automotive research laboratory and experimental shop. **$100,000.**

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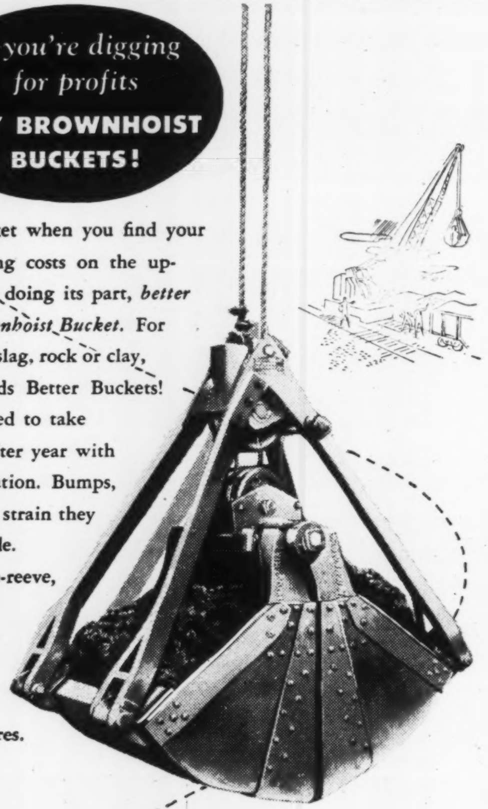

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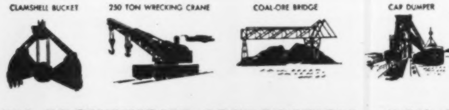
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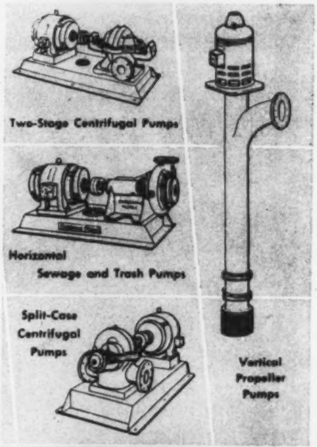
COAL-ORE BRIDGE
CAR DUMPER

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICH.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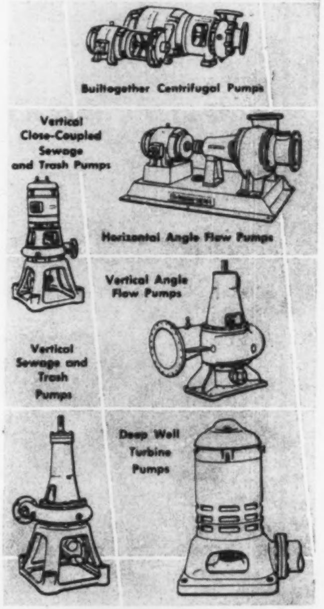
Builtogether Centrifugal Pumps
Vertical Close-Coupled Sewage and Trash Pumps
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Vertical Angle Flow Pumps
Vertical Sewage and Trash Pumps
Deep Well Turbine Pumps

Tex., Stinnett—PLANT—Stacey-Dresser Engineering Div. (Dresser, Interests), 1900 Superior St., Cleveland, O., desulfo plant, 2,750,000 cu. ft. daily capacity of removing excess hydrogen sulfide from natural gas. **$500,000.**

Tex., Sugarland — PLANT — Imperial Sugar Co., plans by Addis E. Noonan & Assoc., 803 American Hospital and Life Bldg., San Antonio, and 1750 W. Gray Ave., Houston, 5 story and monitor, structural steel, rein.-con. remelt sugar plant unit. **$200,000.**

Tex., Tyler—PLANT—Bryant Heater Div., Tyler, 30,000 sq. ft. plant expans. **$100,000.**

●**Wash., Kennewick** — PLANT — Welch Grape Juice Co., Westfield, N. Y., grape juice plant. **$1,000,000.**

Wash., Seattle—GARAGE SHOP—Northwest Greyhound Lines, 8 Ave. and Stewart St., Zone 1, plans by V. W. Voorhees, 2106 30 Ave. S., bus garage shop addn. **$250,000.**

Wash., Spokane — WAREHOUSE — Seattle Steel Co., 1220 4 Ave. S., Seattle, 100x300 ft. warehouse to operate under name of Inland Empire Steel Co. **$200,000.**

Wis., Racine—FREIGHT TERMINAL—Service Transport Co., 2-5 St., 1 and 2 story, 181x282 ft., steel, concrete, brick freight terminal, concrete fdn. Hugo Bothe, 5533 6 Ave., Kenosha, consult. engr.

Alta., Edmonton—GARAGE—Borrows Motors Ltd., 10110 106 St., 1 story, 100x120 ft. concrete, steel, brick garage. **$100,000.**

B. C., Chemainus — MILL — Victoria Lumber Co. Ltd., Chemainus, mill. **$200,000.** Pearson & Phillips, 1701 W. Broadway, Vancouver, engrs.

B. C., Deep Bay (Postal Dist. Union) — PLANT — British Columbia Cement Co. Ltd., Dep Bay, plant. **$500,000.**

B. C., Falkland—MINE DEVELOPMENT—Western Gypsum Ltd., Calgary, Alta., palagonite deposit development. **$100,000.**

●**B. C., Nanaimo**—PLANT—H. R. MacMillan Export Co. Ltd., 837 W. Hastings St., Vancouver, plant, **$3,750,000.**

●**B. C., Quesnel**—MILL—Bowater Ltd., St. Johns, Newfoundland, and London, England, pulp mill, **$1,000,000.**

Man., Winnipeg—GARAGE—Carter Motors Ltd., 275 Maryland St., plans by L. Finch, C.P.R. Bldg., 2 story, brick garage, **$150,000.**

Ont., London — FOUNDRY — General Steel Wares, 199 River St., Toronto, foundry addn., **$500,000.**

Ont., North Bay — PLANT — North Bay Publishing Co., Klock St., plans by N. A. Armstrong, 19 Melinda St., Toronto, 2 story, 32x66 ft. plant, Main St. Approx. **$250,000.** CD 9/3—ENR 9/9.

●**Ont., Toronto** — FACTORY — Lever Bros., Ltd., 229 Eastern Ave., factory, Eastern Ave., south of Keating St. Approx. **$1,000,000.**

Ont., Windsor—FACTORY—Canadian Motor Lamp Co., Ltd., 2429 Seminole St., plans by G. A. McElroy, 152 Pitt St., 1 story, 40x480 ft. concrete, brick factory. **$150,000.**

P. E. I., O'Leary—PLANT—Fred Champion, electric plant.

Que., Montreal—PLANT—Do So Iron & Metal Co., Ltd., 5814 W. Sherbrooke St., 1 story, concrete, steel plant. **$150,000.**

Que., Montreal—BUS GARAGE—Provincial Transport Ltd., 1188 Dorchester St., plans by Shorey-Ritchie & Douglas, 2048 Union Ave., bus garage. **$150,000.** CD 3/6/46.

Que., St. Johns—MILL—Doric Textiles, c/o Joseph M. Besso, North American Commercial Corp., 150 Broadway, New York, N. Y., U. S. A., mill, **$500,000.**

●**Que., St. Johns**—PLANT—Les Usines Textiles Al-Kahira, c/o J. M. Besso, 150 Broadway, New York, N. Y., U. S. A., plant, Mackenzie King St. Approx. **$2,000,000.**

Que., St. Lambert—PLANT—Eugene Gagnon Assoc., c/o Dpt. Mines, Quebec City, plant mfg. vitrolite, **$100,000.**

Que., Sherbrooke—PLANT—Eugene Gagnon Assoc., c/o Dpt. Mines, Quebec City, plant and 400 acre property development of Petronite deposits, **$750,000.**

Sask., Saskatoon—GARAGE—Mid-City Motors, Ltd., J. B. Sangster, genl. mgr., Second Ave. and Nineteenth St., garage. Approx. **$125,000.**

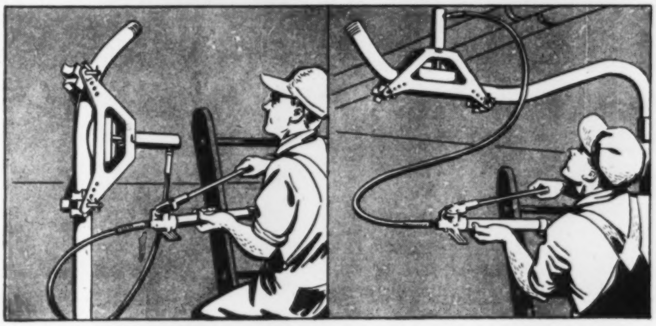
UNCLASSIFIED

Alabama — RURAL DISTRIBUTION LINES — Southern Pine Electric Co-operative, Brewton, 185 mi. distr. lines, sys. imprvs. two-way radio communication sys. and completion of previously approved constr., Conecuh Co. **$490,000.**

Arizona — RURAL DISTRIBUTION LINES — Trico Electric Co-operative Tucson, 53 mi. rural distr. lines and two-way radio communication sys., Pima Co. **$190,000.**

Arkansas—RURAL DISTRIBUTION LINES —Arkansas Valley Electric Co-operative Corp., Ozark, 400 mi. rural distr. lines, to serve 1,000 customers in Crawford, Franklin, Johnson, Newton, Pope, Yell, Scott, Logan and Sebastian Counties. **$400,000.** H. B. Gieb & Assoc., 1207 Texas Bank Bldg., Dallas, Tex., consult engrs. CD 7/16—ENR 8/5.

You Get 4 Exclusive Advantages with a Blackhawk Pipe Bender

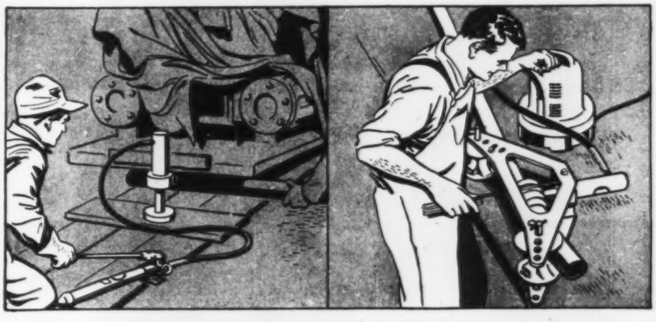


1. WORKS IN ANY POSITION

A Blackhawk Porto-Power Pipe Bender is completely versatile. It works in any position — vertical — horizontal — or at any angle. The remote control Porto-Power pump makes this extra utility possible.

3. TAKE IT RIGHT TO THE JOB

A Blackhawk pipe bender's light weight and all-directional operation lets you bend pipe right at the installation instead of lugging pipe to the bender. Saves time — work — steps — makes it easier to fit bends to obstructions.



2. DO OTHER WORK

The Blackhawk Porto-Power hydraulic unit detaches to work with numerous other Porto-Power attachments to handle dozens of lifting, pulling, pushing, clamping, pressing, bending and spreading operations.

4. ELECTRIC OPERATION IF DESIRED

P-182 electric pump permits *finger-tip control* pipe bending — speeds work —leaves hands free for measuring. Ideal for continuous bending of elbows, etc. P-182 also can convert any other hydraulic equipment to power operation.

S30A Pipe Bender with 10-ton hydraulic unit handles rigid conduit and pipe in 1, 1¼, 1½ and 2" diameters.

S36 Pipe Bender with 20-ton hydraulic unit handles rigid conduit and pipe from 1¼ to 4" in diameter.

Your Blackhawk Industrial Supply Distributor will give you full information on cost-cutting Blackhawk Porto-Power Pipe Benders.

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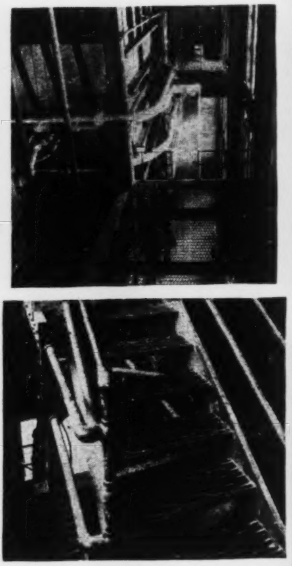

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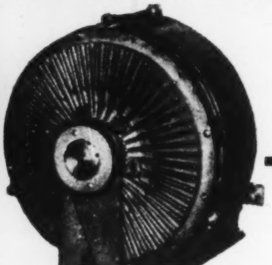

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Ark., Little Rock—PLAYGROUNDS—Little Rock Parks & Recreation Dpt., Little Rock, approved bond issue, 4 playgrounds, community house and swimming pool for negroes. **$359,000.**

Calif., Long Beach—SPORTS BLDG., etc.—Bd. Educ., 715 Locust Ave., plans by Kenneth S. Wing, 30 Linden Ave., under bleachers sports bldg., rifle range, locker room, storage room, etc. at Jordan High School. **$123,000.**

Calif., Los Angeles—BATHHOUSE, etc.—Los Angeles City Bd. Recreation & Parks, 305 City Hall, 30x110 bathhouse and 16x120 ft. swimming pool and bleachers at Tujunga. **$120,000.** Holmes & Narver, 824 S. Figueroa St., consult. engrs.

Conn., Bridgeport—DOCK IMPRVS., etc.—Jasper McLevy, mayor, City Hall, imprv. section dock and parking space, **$125,000.** Henry L. Rowland, City Hall, city engr.

Conn., Norwalk — PLAYGROUNDS — City, Irving J. Freese, mayor, City Hall, paved sections various playgrounds, **$150,000.** Paul J. James, City Hall, city engr. CD 3/23/44—ENR 4/6/44.

Conn., Norwalk—STADIUM—City, Irving C. Freese, mayor, City Hall, concrete sports stadium, incl. athletic field and stands, **$250,000.** Paul J. James, City Hall, city engr. CD 2/1/47—ENR 4/6/47.

Conn., Norwalk—MUNICIPAL ELECTRIC EXPANSION—City, Third Taxing Dist., Norwalk, municipal electric expans., enlargement electric power facilities. **$250,000.**

Florida—RURAL DISTRIBUTION LINES—Lee County Electric Co-operative, Ft. Myers, 35 mi. rural distr. line, sys. imprvs., Lee Co. **$150,000.**

Ga., Atlanta — PARK — City, plans by William C. Pauley, 140 Peachtree St., negro park in Crogman School Section, incl. swimming pool, bath house and athletic field. **$375,000.**

Ga., Augusta — SWIMMING POOLS — City, plans by Willis Irvin, Augusta, swimming pool on Steed School grounds, over **$50,000;** plans by E. Lynn Drummond & Lyman, H. Robertson, Augusta, swimming pool in Allen Park, over **$50,000.**

Idaho — RURAL DISTRIBUTION LINES — Idaho County Light & Power Co-operative Assoc., Grangeville, 22 mi. electric distr. line and sys. imprvs., Idaho Co. **$160,000.**

Illinois — RAILROAD — Illinois Central R.R., C. H. Mottier, vice-pres. and ch. engr., 135 E. 11 Pl., Chicago, 9.5 mi. railroad line into coal fields of Berry and Jefferson Counties, from Bois, eastward to mine of Chicago, Wilmington and Franklin Coal Co.

●**Ind., Ft. Wayne** — TERMINAL — New York, Chicago & St. Louis R. R., H. F. Whitmore, ch. engr., Terminal Tower, Cleveland, O., engine terminal, car repair facilities, addnl. tracks. **$2,000,000.**

●**Kentucky** — RURAL DISTRIBUTION LINES — Warren Rural Electric Co-operative Corp., Bowling Green, 215 mi. rural distr. lines, sys. imprvs., two-way radio communication sys., headquarters facilities, Warren Co. **$1,000,000.** CD 2/5/48—ENR 2/19/48.

●**N. J., Hoboken** — PIER — Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., restoring, developing federally owned pier. **$17,000,000.**

●**N. J., Jersey City** — MARINE TERMINAL — Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., 2-pier marine terminal between Morris Canal Basin and Exchange Pl. **$13,000,000.**

●**Ohio** — TRACK ALIGNMENT IMPRVS. — Pennsylvania Railroad, D. L. Sommerville, ch. engr. (Central Region), Pennsylvania Station, Pittsburgh 22, Pa., imprv. track alignment and considerable reduction in curvature, incl. modernizing Tunnel No. 5, 3,260 ft. long west of Gould, $815,000; addnl. trackage constructed east of present tunnel; Tunnel No. 6, 472 ft. long will be replaced with a cut, $1,828,500; Tunnels Nos. 7 and 8, 15 mi. west of Steubenville, to be bypassed by constructing new line, $3,295,100; Tunnel No. 10, 1,420 ft. long and located west of Bowerston, incl. new alignment of track and construction 900 ft. tunnel. Total est. **$8,800,000.**

●**O., Toledo**—SUBTERRANEAN PARKING GARAGE — City, City Hall, preliminary sketches by Wernert, Taylor, Sanzenbacher & Morris, Nicholas Bldg., subterranean parking garage under Courthouse Square with roof about 2 ft. under current sidewalk level. **$1,000,000.**

Oklahoma—RURAL DISTRIBUTION LINES—Alfalfa Electric Co-operative, Cherokee, 193 mi. rural distr. lines, Alfalfa Co. **$350,000.** G. P. Easley, Cherokee, consult. engr. CD 1/14—ENR 2/3.

Oklahoma—RURAL DISTRIBUTION LINES—Caddo Electric Co-operative, Binger, 314 mi. rural distr. lines, Caddo Co. **$635,000.** C. H. Guernsey & Co., 1414 N. Robinson St., Oklahoma City, consult. engrs. CD 1/14—ENR 2/3.

Oklahoma—RURAL DISTRIBUTION LINES—Kay Electric Co-operative, Blackwell, 139 mi. rural distr. lines, sys. improvs., incl. 12 mi. new tie lines and completion previously approved constr., Kay Co. **$470,000.**

THIS JOB ON A BUSY STREET CALLED FOR THE PUMP THAT STAYS BUSY!

North Fourth Street in Milwaukee, Wisconsin, is a busy thoroughfare, especially the block between West Michigan Street and Wisconsin Avenue. To lay a new, larger sanitary sewer on this heart-of-the-city job, contractor Otto P. Seefeld had to have equipment that would keep busy without fail.

In the illustration, two Marlow Self-Priming Centrifugal Pumps (a 4-inch 40M and a 30-inch 20M) are shown by-passing sewage as the construction of the new line progresses. In this service these pumps were called on to pump continuously. Large business buildings in the area and a Y.M.C.A. building across the street were depending on them.

The contractor depended on these Marlows, too. There was no room here for a pump that couldn't stay on the job without attention.

A Marlow Water Wizard stays busy. It doesn't quit pumping and need to be reprimed. It doesn't need adjustment or manipulation and there are no parts to jam or cause trouble. It doesn't hold up work to be cleaned. You can't beat a dependable Marlow Water Wizard.

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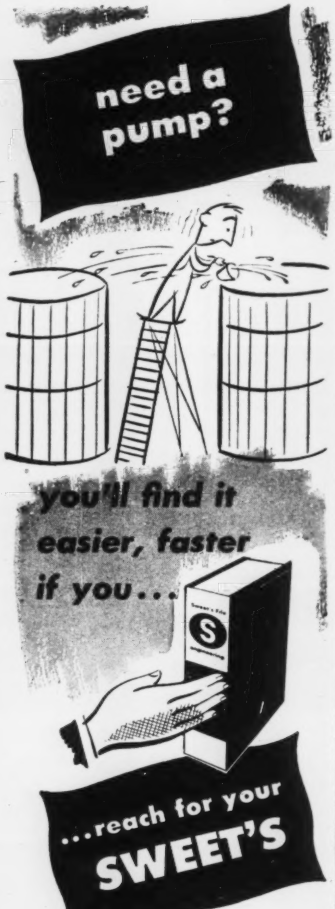
RIDGEWOOD, NEW JERSEY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CONSTRUCTION REPORTS

Bids—Contracts—First Section

WATER SUPPLY

BIDS ASKED

March 23

N. J., Camden—City, watermains Cooper St. Over $50,000. CD 6/18—ENR 7/7.

April 1

Ark., Searcy—City, water and sewerage sys. extens. $210,000. K. W. Lefever, Gazette Bldg., Little Rock, engr. CD 10/6—ENR 10/28.

†Idaho—Bureau Reclamation, Dpt. Interior, Lewiston, water treatment plant, Lewiston Orchards, Lewiston Orchards Proj., Spec. 2596.

O., Ashland—City, WW extens., 1,500,000 gal. per day expans. of existing 1,500,000 gal. per day water softening and treatment plant. $250,000. Plans deposit $25. Paul A. Uhlmann & Assoc., 1441 N. High St., Columbus, engr.

About April 12

†W. Va., Parkersburg—U. S. Eng., Madison Ave. and 8 St. W., Huntington, Zone 18, constructing 34 St., WW, and power plant pump stations, local protection proj. CD 7/25—ENR 8/1.

April 27

W. Va., Clarksburg—Clarksburg Water Bd., Clarksburg, laying 20,000 lin. ft. 8 and 12 in. distr. mains. Alvord, Burdick & Howson, 1401 Civic Opera Bldg., Chicago, Ill., engrs.

May 3

Que., Beauceville East—Secy., c/o Municipality, WW sys. $272,000. G. Demers, 71 St. Peter St., Quebec City, engr. CD 1/9/48—ENR 1/22/48.

LOW BIDDERS

Ark., Forrest City—City, Forrest City, Feb. 24, water dist. sys. extens., from G. H. Young Constr. Co., Morrillton **$44,984.** CD 2/16.

Calif., Vallejo—City, City Hall, Mar. 2, water treatment plant on Fleming Hill, from O. R. Dams Constr. Co., Rt. 7, Box 1143, Sacramento, **$71,450.** CD 2/17—ENR 2/24.

Conn., Willimantic—City, R. F. Paulhus, city clk., City Hall, Feb. 28, constructing Contr. 1, existing water treatment plant and pumping station addns., alterations, and misc. appurtenances from Seminole Constr. Co., 24 Edison St., East Hartford, **$114,400.** CD 2/10—ENR 2/17.

Pa., Norristown—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Mar. 2, mechanical and piping constr. for water supply sys. addns. at Norristown State Hospital from Corbits, Inc., 225 S. Front St., Reading, **$291,000.** Est. $400,000. CD 2/21—ENR 2/24.

Tex., Rockdale—City, Mar. 1, WW sys. expan., imprvs., mostly c. i. distr. lines, from City Constr. Co., 2411 Inwood Rd., Dallas, **$33,000,** est. $64,000; water well, supply, from Layne-Texas Co., 5402 Lindale St., Houston. Items 1 and 2, **$37,518.** CD 2/8—ENR 2/10.

Tex., Westover Hills (Fort Worth)—City, R. Garrett, mayor, Westover Hills, Feb. 24, two 400,000 gal. steel rein-con. ground storage reservoirs, from Parkersburg Rig & Reel Co., 632 Fort Worth Club Bldg., Fort Worth, **$78,000,** est. $100,000; drilling, developing 4 water supply wells, from Texas Water Wells, Inc., 951 McCarty St., Houston, **$66,000,** est. $70,000. CD 2/15—ENR 2/17.

CONTRACTS AWARDED

Ala., Demopolis—City, Demopolis, WW imprvs., to Harbet & Cargile, 2337 20 Ave. S., Birmingham, **$85,146.** Bids 3/3. CD 2/11—ENR 2/24.

Neb., Scottsbluff—City, Scottsbluff, WW imprvts. Own forces. **$59,000.** E. Y. Grupe, Scottsbluff, consult. engr.

N. M., Raton—City, City Hall, water treatment plant, incl. filter building, sand filters, office, laboratory to James B. Kenney, 3233 Osage St., Denver, Colo., **$200,000.** CD 4/22—ENR 5/13.

Okla., Oklahoma City—City, Municipal Bldg., 200 N. Walker St., 6, 8 and 12 in. c. i. watermains serving Nichols Country Club Heights to Lippert Bros. Constr. Co., 2800 N. Santa Fe St., **$47,900.** Est. $51,400. Awarded 3/2. CD 1/22/48—ENR 2/5/48.

S. C., Greenville—City, Pub. Wks. Comn., H. C. Beattie, chn. WW imprvts. to Leo Barber, Silver Springs, Md., Sec. 1, **$147,564;** Sec. 2, **$111,495.** Bids 3/1. CD 2/7—ENR 2/7.

Tex., Crockett—City, waterlines. Own forces. **$45,000.**

Utah, Provo—City, c/o I. G. Bench, recdr., installing 16,630 lin. ft. 20 and 24 in. steel pipe, appurtenances as part of supply to City's water sys. to Kloepfer Sand, Gravel & Constr. Co., Ogden, **$34,731.** Bids 2/23. CD 2/16.

SEWERS, WASTE DISPOSAL

BIDS ASKED

March 28

Ont., Scarborough—E. Knott, 1160 Kingston Rd., 14,315 ft. 8- to 30-in., 11,242 ft. 8- to 21-in., 13,671 ft. 8- to 24-in. storm and sanitary sewers, for Twp. of Scarborough, E. M. Baird, 1660 Kingston Rd., town engr., and Proctor, Redfern & Laughlin, 11 Jordan St., Toronto, engrs.

March 31

Tex., Alvin—City, sewage disposal. $115,000. Garrett Eng. Co., 1806 Milam St., Houston, engr.

April 5

N. J., Middlesex—At office, Fred Martin, secy. Joint Meeting of City of Plainfield, North Plainfield Boro and Dunellen Boro, City Hall, Plainfield, imprv., enlarging joint sewage disposal plant, Contr. B. Plans deposit $20. Elson T. Killam, 140 Cedar St., New York, N. Y., consult. engr.; adv. ENR 3/10.

April 11

La. Bastrop—City, City Hall, sanitary sewer extens., pump. stations, etc. Plans deposit $15. Pan American Engineers, 1418 3 St., Alexandria, engrs. CD 10/6—ENR 10/28.

April 15

O., Columbus—City, Elmer A. Keller, Dir. Pub. Service, sewerage treatment, expans. of sludge digestion facilities. $800,000. Plans deposit $25. Paul A. Uhlmann & Assoc., 1441 N. High St., engrs. CD 11/19/45—ENR 11/29/45.

June 1

Tex., Houston—Dixon Packing Co., 4821 Calhoun Rd., waste treatment plant. $50,000. Lockwood & Andrews, Union Natl. Bank Bldg., engrs.

Tex., Houston—Port City Packing Co., Inc., 4905 Calhoun Rd., waste treatment plant. $60,000. Lockwood & Andrews, Union Natl. Bank Bldg., engrs.

LOW BIDDERS

Calif., Novato—Town, Mar. 1, lateral sewerage sys., from W. M. Shives, 5959 Venice Blvd., Los Angeles, **$149,750.** CD 2/14—ENR 2/17.

Conn., Bristol—City, Municipal Offices, City Hall, Feb. 24, force mains and appurtenances, Riverside Ave. and Broad St., from New Britain Trucking Co., 1146 East St., New Britain, **$248,914;** sewage pumping station, Broad St., from J. F. Kelly, 902 Chapel St., New Haven, **$94,665.** CD 1/20—ENR 2/3.

Ga., Atlanta—Fulton Co., Atlanta, Mar. 2, outfall sewers from Nichols Contg. Co., 563 Trabert Ave. N. W., **$272,436;** lateral sewers, from M. G. Aldridge, Macon, **$76,350.** CD 2/7—ENR 2/17.

Ill., Belleville—City, Carl Siegel, city clk., City Hall, 35,705 lin. ft. 8- to 48-in. vitr. clay and rein.-con. sewers, 1,550 lin. ft. 6- to 20-in. c. i. pipe sewers, 3 sewage lift stations and pumps for existing lift stations, appurtenances, Sections 1 to 11. Section 1 and Section 5, from Martin Bros., 7735 Sappington Ave., St. Louis, Zone 5, Mo., **$106,074;** and **$17,423** respectively. Sections 2, 3, 4, 6, 7, 8, 9, 10 and 11, from Hoeffken Bros., Inc., 222 W. B St., **$207,868.**

Mass., Taunton—City, Bd. Sewer Comrs., Taunton, Feb. 18, sewage disposal plant, Group 1, electrical work, from Hart Eng. Co., 190 S. Water St., Providence, R. I., **$147,854.** CD 1/25—ENR 1/27.

Tex., Port Arthur—City, drainage laterals and sewer main from East Texas Constr. Co., 165 4 St., Beaumont, **$71,208.** J. B. Converse & Co., Port Arthur, engr.

Tex., Rockdale—City, J. B. Newton, mayor, Mar. 1, sanitary sewerage sys. extens., imprvs., from City Constr. Co., 2411 Inwood Rd., Dallas. **$67,500.** Est. **$56,000.** CD 2/8—ENR 2/10.

CONTRACTS AWARDED

Miss., Lexington—City, City Hall, sanitary sewer imprvs., to Mathews & Whitfield Constr. Co., Tupelo, **$98,310.** Bids 3/1, awarded 3/3. CD 2/16.

Miss., Starkville—City, City Hall, imprv. sewage disposal sys., to Voltz Constr. Co., Ripley, Tenn., **$129,000.** CD 12/2—ENR 12/9, under LB.

Tex., Crockett—City, sanitary sewers. Own forces. **$65,000.**

Tex., San Benito—City, lift station, pressure mains, rehabilitation sewage disposal plant, Units 2 and 3, to Fitzgerald & Co., Donna, **$116,500** est. $125,000; sanitary sewer collection sys., extens., imprvs. to existing lines Unit 1, to Contractors Assoc. Inc., Port Lavaca, **$126,000** est $175,000. Bids 2/2. CD 1/5—ENR 1/20.

Simplifies Construction of 750-Foot Tower with Arc Welding

By J. B. McCormick, Welding Engineer
The Lincoln Electric Company • Los Angeles, California

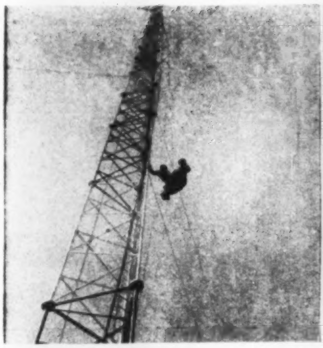

Fig. 1. All welded steel, solid rod, 750-foot radio tower at Buena Park, California.

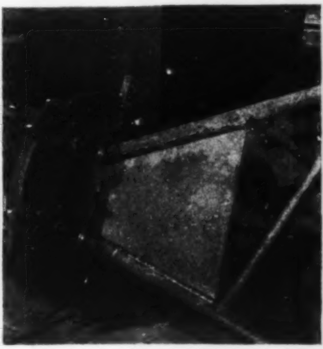

Fig. 2. Base construction for tower incorporates gusset plates fillet welded to solid steel bars with two-pass welds.

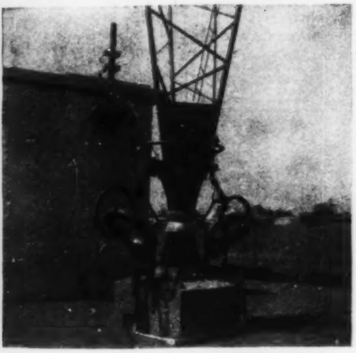

Fig. 3. Bottom section of 104,740-pound radio tower shows arc welded base design and ceramic insulator.

GREATER strength and less wind resistance through the use of solid round steel rod construction are achieved in the construction of the 750-foot radio tower for Station FKI at Buena Park, California. Replacing an old 400-foot T-type radio tower of riveted design, this radio tower, highest west of the Rockies, has been erected faster and at less cost with arc welding than would have been possible with other methods.

Unique in its construction, this tower (Fig. 1) is made up of thirty-seven 20′ triangular sections bolted together during erection. The base (Fig. 2) is a 24″ diameter 1½″ plate to which 4″ round solid rods are fillet welded. Gusset plates, flame cut from steel sheet, are fillet welded to the bars and the base for added strength. A special insulated pin connection (Fig. 3) is bolted to the base plate.

The twenty-foot triangular sections are weld-fabricated from 4″ solid bar members cross braced with 1⅜″ solid round bars. Steel flanges are first fillet welded to the 4″ vertical solid bars. The welding is done on a rotary fixture allowing downhand welding with two passes. The first pass is made with ¼″ "Fleetweld 7" and the second pass with "Fleetweld 11," using 400 amp. motor driven Lincoln "Shield-Arc" DC welders. While the fillet welds are being made as shown in Fig. 4, a second welder on a scaffold makes an inside weld on the flange at the opposite end of the 20′ bar eliminating the need for repositioning or turning the bars about.

The triangular section is tack welded first in a simple clamp fixture and then moved to a trunnion-mounted positioning jig (Fig. 5) to permit down-hand welding wherever possible. With this setup, two welders complete two and a half sections in eight hours. International Derrick and Equipment Co. of Torrance are the fabricators, and Skyway Construction Co. of La Habra, California, are the erectors.

Fig. 4. Fillet welding steel flange to solid steel rod for upright members of section.

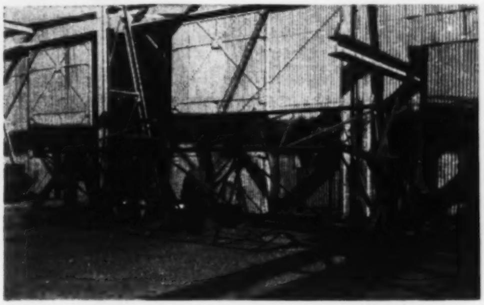

Fig. 5. Finish down-hand welding of 20-foot section in positioning jig.

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BRIDGES

LOW BIDDERS

Calif., San Leandro—City, City Hall, Feb. 28, concrete rigid frame bridge over San Leandro Creek at Bancroft Ave., from Stanley W. Taylor, 1201 Fulton St., San Francisco, **$84,343.** CD 2/15—ENR 2/17.

Maryland—State Hy. Dpt., Baltimore, Mar. 8, superstructure Chesapeake Bay Bridge, Queen Anne and Anne Arundel Counties, from Bethlehem Steel Co., Mercantile Trust Bldg., Baltimore, **$16,854,104.** CD 2/16—ENR 2/24.

Wisconsin—State Hy. Comn., Madison, Mar. 1, Oconto River Bridge, approaches 0.08 mi. Abrams-Stiles Rd., U. S. Hy. 141, Contr. 1, Proj. T 040-1 (5), Oconto Co., from Donaldson Bros. Constr. Co., Menomonie, **$49,623.** CD 2/11—ENR 2/17.

CONTRACTS AWARDED

Ont., Toronto—Municipality, bridge, Huntley St., to George Hardy Ltd., 163 Wickstead Rd., Leaside, **$341,721.** CD 11/30—ENR 12/2. Bids 11/23.

STREETS AND ROADS

LOW BIDDERS

Maryland—State Hy. Dpt., Baltimore, Mar. 1, bit. 3.47 mi. Spec. B along Uhl Hy., State Rt. 51, Contr. A 405-1-615, Allegany Co., from Keeley Constr. Co., Clarksburg, W. Va., **$205,390** ***b. conc. 9.1 mi. Spec. B., U. S. Rt. 50, Contr. G. 237-1-615, Garrett Co., from Cumberland Contg. Co., Cumberland. **$100,064*****c. conc. 0.538 mi. section State Rt. 404, Contr. T 125-1-215, Talbot Co., from George & Lynch, 18 and Broom Sts., Wilmington, Del., **$104,326.** CD 2/24.

Mo., Kansas City—City, c/o J. V. Lewis, supt. Parks, City Hall, paving, curbing Riverside Dr. and Boathouse Rd., Swope Park, from Midwest Pre-Cote Co., 7600 E. 17 St., **$62,401.** CD 5/27/43.

CONTRACTS AWARDED

Neb., Omaha—Douglas Co., Omaha, paving county mail route roads, to Yant Constr. Co., 917 N. 45 St., **$74,319.** Bids 2/21.

Man., Winnipeg—Municipality, concrete paving various roads, day labor, **$255,485.** CD 4/24/47—ENR 5/15/47.

Ont., Brantford—Brant Co., Brantford, road reconstruction, day labor. **$68,000.** R. Lee, co. engr. CD 3/3/47—ENR 3/20/47.

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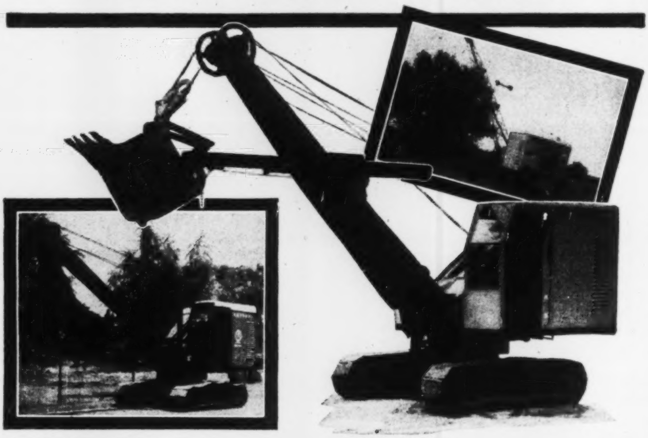

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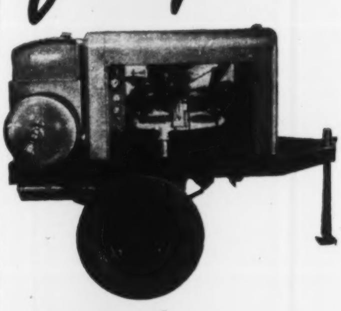

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EARTHWORK, WATERWAYS

BIDS ASKED

March 22

†Colorado — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, approx. 3,000 bbl. portland cement in paper sacks for constr. diversion works and Fire Mountain Canal, Pavnia Proj., Spec. 2597. L. N. McClellan, c/o owner, ch. engr.

March 25

Minn., St. Peter — Nicollet Co. H. Overn, aud., St. Peter, 570,987 cu. yd. excavation, 2 creosoted timber bridge, 1,080 lin. ft. 15- to 72 in. sectional concrete or corrugated metal culverts, County Ditch No. 30, $102,547. CD 8/31—ENR 9/2, under LB.

March 31

†Iowa—U. S. Eng., 1709 Jackson St., Omaha, Neb., levees, appurtenances, Unit II, near Council Bluffs, incl. Schedule A, 195,000 cu. yd., embankment, 100 lin. ft. 60 in. CMP, one rein.-con. outlet structure, 86 acres, clearing, and grubbing 16 acres seeding, Schedule B, $987,000 cu. yd. unclassified excav., 100 lin. ft. 30-CMP, 1 rein.-con. outlet structure, 67 acre seeding; Schedule C, incl. Schedules A and B, Serial No. Eng. 25-066-49-137. Extended date. CD 2/25.

April 5

†California—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Herdlyn, Calif., materials for power cable trays, motor floor elevation 38.63 and control cable trays, cable galley-elevation 23.63 in Tracy Pumping Plant and materials for control cable duct, incl. structural steel, floor grating, louvers insulated panels, steel roof deck, gravel stops, metal flashing sill angles, bearings, appurtenant parts, bolts, and fastenings for Tracy Pumping plant, Central Valley Proj., Spec. 2593. L. N. McClellan, ch. engr.

†Oregon-California — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point, or f.o.b. cars Tule Lake, Calif., five 36 in. diam. flap gates for Pumping Plant D, Modoc Unit, Klamath Proj., Spec. 2592.

†Oregon — Bureau Reclamation, Dpt. Interior, Bldg 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point, or f.o.b. cars Prineville, one 44 in. diam. welded-plate-steel pipe with support rings, rings, manholes, flange, couplings, drains and accessories for repair of outlet works at Ochoco Dam, Deschutes Proj., Spec. 2590.

April 6

†Montana—Bureau Reclamation, Dpt. Interior, Old High School Bldg., North Warren St., Helena, Canyou Ferry Dam, Power Plant, Canyon Ferry Unit, Missouri River Basin Proj., on Missouri River, 16 mi. northeast of Helena, Spec. 2585. CD 9/5/45—ENR 9/13/45.

April 7

†Nebraska-Kansas — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Guide Rock, Neb., six 5x10 ft. top seal radial gates with pin bearings; 10 in. wall plates, gate sills, bottom plates, top and bottom bars; two 12x20 ft. radial gates with 5 in. diam. rollers, pin bearings, 10 in. wall plates and gate sills; six 5,000 lb. and two 10,000 lb. motor-operated radial-gate hoists for Superior-Courtland Diversion Dam, Bostwick Unit, Spec. 2595.

April 12

†Colorado — Bureau Reclamation, Dpt. Interior, Monte Vista, constr. Platoro Dam on Conojos River about 1 mi. upstream from Platoro, San Luis Valley Proj., Spec. 2594. L. N. McClellan, Bldg. 1A, Denever Federal Center, Denver, ch. engr.

About April 15

†West Virginia—U. S. Eng., Madison Ave. and 8th St. W. Huntington, furnishing, del. crest gates, incl. frames and operating machinery, trash chute gate and bulkheads for the Bluestone Dam, Bluestone Reservoir Proj. New River.

LOW BIDDERS

†California — U. S. Eng., 1209 Eighth St., Sacramento, Mar. 1, levee construction on North and South Levees of Deer Creek, Tehama Co., Serial No. Eng-04-167-48-58, Spec. 1333, from N. M. Ball & Sons, Box 430, Berkeley, **$212,811.** CD 2/9—ENR 2/17.

Mass., Boston — Commonweath of Mass., Metropolitan District Commr., 20 Somerset St., Mar. 3, repairs, large boat lock and gates, Charles River Reservation, Charles River Dam, from Marinucci Bros. & Co., 51 Ceylon St., Dorchester, **$38,295.**

†Mass., West Springfield — U. S. Eng., Army Base, Boston, Zone 10, Mar. 3, Riverdale Dike and Wayside and Riverdale Pumping stations, West Springfield, Serial No. Eng., 19-016-49-35, from Daniel O'Connells Sons., Inc., 480 Hampden St., Holyoke, **$783,067.** CD 1/24—ENR 2/3.

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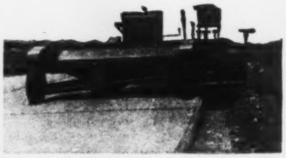

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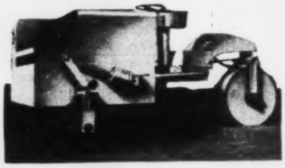

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†Nebraska — U. S. Eng., 1709 Jackson St., Omaha, Mar. 3, agricultural levee along right bank of Missouri River, Eng-25-066-49-179, from Luhr Bros., Columbia, Ill., **$377,898.** Est. $402,369. CD 2/9—ENR 2/17.

†New Jersey — U. S. Eng., 120 Wall St., New York 5, N. Y., Mar. 8, maintenance dredging Passaic River, near Harrison from Arundel Corp. Ft. Fulton St., Brooklyn, **$313,089.** Est. $252,576. CD 3/2.

●†Washington — Bureau Reclamation, Dpt. Interior, Coulee Dam, Mar. 1, earthwork, concrete lining and structures for West Canal, Station 351 plus 71.86 to 381 plus 84.70 and 511 plus 35 S.L. to 1229 plus 74, Spec. 2541, Columbia Basin Proj. from Morrison-Knudsen Co. Inc., Hoge Bldg., Seattle, **$6,136,234.** CD 1/25—ENR 1/27.

CONTRACTS AWARDED

●†California — Bureau Reclamation, Dpt. Interior, Coachella, earthwork, pipelines, structures, laterals 119.64 to 123.4 sublaterals Unit 6, Coachella Valley Distr. Sys., All-American Canal Sys., Boulder Canyon Proj., Spec. 2488, to American Pipe and Constr. Co., P. O. Box 3428, Terminal Annex, Los Angeles, 54, Calif., **$2,049,923.** Bids 1/4, awarded 3/3. CD 1/11—ENR 1/13, under LB.

†California — Bureau Reclamation, Dpt., Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., radial gates for Friant Kern Canal Station 3765 plus 75.00, 3876 plus 50.67 and 4410 plus 00, Central Valley Proj., Spec. 2496, to Berkeley Steel Constr. Co., Inc., 2 and Camelia Sts., Berkeley, **$29,980.** Bids 1/11, awarded 3/3. CD 12/15—ENR 12/30.

Conn., Old Saybrook — Ernest M. Hull, Old Saybrook, T-shaped 450 ft. long pier, 50 ft. finger pier providing berths for boats, dredging to depth of 6 ft. at low water, own forces, **$50,000.**

†Louisiana—U. S. Eng., foot Prytania St., New Orleans Zone 9, 110,000 cu. yd. uncompacted earthwork, drainage structures, etc., Atchafalaya Basin Protection Levees, Serial No. Eng., 16-047-49-219, to Modern Constr. Co., P. O. Box 1732, Baton Rouge, **$44,313.** Bids 2/11, awarded 2/15. CD 2/2.

†Nebraska — Bureau Reclamation, Dpt. Interior, Superior, constructing Superior-Courtland diversion dam and earthwork and structures for Superior Canal, Station 1 plus 74 to 10 plus 00, Spec. 2495, Missouri River Basin Proj. Bostwick Unit to Knisely-Moore Co., Douglas, Wyo., **$866,263.** Bids 1/20. CD 1/25—ENR 1/27, under LB.

Tex., Fannett (Beaumont P. O.) — Coastal Soil Conservation Dist., c/o G. Clubb, R. F. D. 2, Box 230, Fannett, via Beaumont, terracing, grading, earthen tanks, revetments, drainage. Own forces. **$90,000.** CD 8/19/48—ENR 9/2/48.

Tex., Wink — Wink Independent School Dist., Wink, school grounds imprv., grading, levelling, drainage, steel stadium, to Subblefield Constr. Co., P. O. Box 590 Pecos Tex. and Central Texas Iron Works, Abilene, **$59,580.** Buford & Feinberg, 1801 San Jacinto St., Dallas, engrs.

AIRPORTS AND AIRBASES

BIDS ASKED

April 14

†Va., Gravelly Point—TERMINAL BLDG.—Pub. Bldgs. Admin., Federal Works Agency Bldg., Wash., D. C., South Exten. to Terminal Bldg. at Washington National Airport Proj. No. 44-094-5. CD 3/4.

PUBLIC BUILDINGS

BIDS ASKED

March 21

†N. J., Bordentown—U. S. Eng., Armory Dr., Trenton, motor vehicle storage. **$60,000.**

†N. J., Pitman—U. S. Eng., Armory Dr., Trenton, motor vehicle storage. **$60,000.**

March 22

●N. Y., Troy—Bd. Contract & Supply, City Hall, high school. Extended date. Frank J. Morgan, 253 Broadway, archt. CD 2/24—ENR 3/3.

⊙N. Y., Troy—Municipal Housing Auth., City Hall, housing proj. Plans deposit $25. Extended date. J. Fletcher Lankton & John W. Ziegle Assoc., 1100 Main St., Peoria, Ill., archts. CD 2/24—ENR 3/3.

March 23

Que., Ste Agathe De Monts—MacDougall, Smith & Fleming, archts., 1235 McGill College Ave., Montreal, school and gymnasium. Approx. $300,000. CD 3/17—ENR 4/1.

March 24

Tex., Houston—Houston Independent School Dist., 1600 Washington St., 16 story, masonry Harris School, concrete slab fdn. and frame, rehabilitation of existing 2 room school; boiler room. $300,000. Herbert Voelcker & Assoc., 2801 San Jacinto St., archts. Stayton Nunn, 2017 W. Gray St., co-ordinating archt. CD 2/4—ENR 2/13.

March 25

†Fla., Jacksonville—U. S. Eng., P. O. Box 4970, Navy Bulk petroleum fuel terminal, Inv. No. Eng-08-123-49-74.

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Man., Brandon—Hon. E. F. Willis, c/o Dpt. P. Wks., Winnipeg, hospital for mental diseases, G. Parfitt, Legislative Bldg., Winnipeg, archt., CD 4/15/46.

March 29

Calif., Mendocino—State Div. Architecture, P. Wks. Bldg., Sacramento, 3 ward bldgs., and combination kitchen, commissary and bakery with combined floor area of approx. 150,000 sq. ft. at Mendocino State Hospital. Plans depositi $25. Anson Boyd, state archt.

†Ga., Camp Gordon (P. I. Augusta)—U. S. Eng., Post Office Bldg., Savannah, rehabilitation of bldgs. facilities, Station Hospital, Serial No. Eng-09-133-47-79. Extended date. CD 2/1—ENR 2/3.

Minn., Breckenridge—Bd. Educ., J. Vertin, Jr., clk., 2 story, brick, stone school addns. and alterations, $375,000. Plans deposit $20. F. W. Jackson, St. Cloud, archt. CD 3/28/45—ENR 4/5/45.

Minn., St. Paul—University of Minnesota, R. S. Callaway, purch. agt., 323 Administration Bldg., Main Campus, 1 story, rein.-con. brick animal and poultry husbandry Bldg., $480,000. Plans deposit $25. C. H. Johnston, 715 Empire Bank Bldg., archt. CD 8/8/47—ENR 8/21/47.

N. Y., Dongan Hills—New York City Housing Auth., 63 Park Row, New York, Zone 7, general constr.; heating and ventilating; electrical and plumbing for General Charles W. Berry Houses, Proj. NYC-19, located in area bounded by Richmond Rd. Dongan Hills Ave., Staten Island Ry. and proposed street (Seaver Ave.) 200 ft. north of and parallel with Stobe Ave. Plans deposit $75. Elevators. Plans deposit $25. CD 12/15.

March 31

†Kansas—Bureau Reclamation, Dpt. Interior, Ellis, remodeling garage and storage, Ellis, Govt. Field Office and laboratory bldg., Cedar Bluff Damsite, Cedar Bluff Unit, Smoky Hill Div., Missouri River Basin Proj., Spec. 7-54 (Region 7). L. N. McClellan, ch. engr.

April 1

Minn., Minneapolis—University of Minnesota, R. S. Callaway, purch. agt., 323 Administration Bldg., Main Campus, 4 story, brick, rein.-con., health service bldg., $600,000. Plans deposit $15. Magney, Tusiter & Setter, 202 Foshay Tower archts.

†Washington—U. S. Eng., 19 E. Poplar St., Walla Walla, design, manufacture and install three 104,000 hp. hydraulic turbines, incl. embedded parts, appurtenances, and pier nosings for 4 units for Ice Harbor Dam power plant. Extended date. CD 12/21—ENR 12/30.

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SMALLER MOTORS . . .

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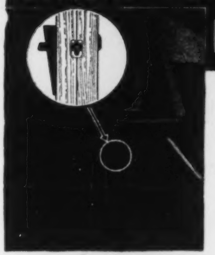

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At left is cross section view of tie.

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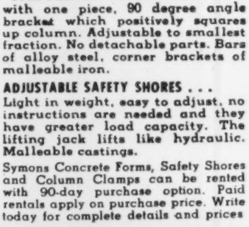

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LOW BIDDERS

†Arizona and Nevada—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., Mar. 1, five 2,000 amp bus structures with current and potentials transformers, disconnecting grounding switches, capacitors and lightning arresters for unit 1 through 5, five 75½ kva transformers, and five 85 kw resistors for Davis Dam Power Plant, Kingman, Davis Dam proj., Spec. 2528, Schedule 1, from I-T-E Circuit Breaker Co., 19 and Hamilton Sts., Phila., Pa., **$90,807.** CD 2/18.

Calif., Clovis—Clovis Union High School Dist., Clovis, Feb. 25, rein.-con. school auditorium, from Dahs Co., 363 Thorne St., Fresno, **$280,286.** CD 2/2—ENR 2/10.

Conn., Plainville—Town, Supt. of Schools, 74 East St., brick steel school addn., Linden St., from Wadhams & May Co., 15 Lewis St., Hartford, **$467,478.** CD 2/2—ENR 2/10.

Me., Portland—City Purch. Agt., City Hall, Deering Oaks Junior High School, Deering and Park Aves., from T. W. Cunningham Inc., 38 Columbia St., Bangor, **$827,700.** J. H. and J. C. Stevens, 187 Middle St., archt. CD 1/30/46—ENR 5/16/46.

Mass., Boston—City of Boston Housing Auth., 10 Post Office Sq., Mar. 4, 48 unit veterans housing proj., Victory Rd., and Adams St., Dorchester, from St. Paul Constr. Co., 603 Boylston St., **$495,397.** Arthur Goldberg, 739 Boylston St., structural engr., CD 2/16—ENR 2/24.

Mass., Norwell—Town, Bldg. Comn., Selectmens Office, Town Hall, Feb. 25, school, from Park Constr. Co. Inc., 40 Court St., Boston, **$318,700.** CD 2/14—ENR 2/17.

●Mass., Somerville—City Housing Authority, C. G. Martignette, 34 North St., chn., Mar. 3, veterans housing proj., Clarendon Hill, corner of North St., Powder House Blvd., Alewife Brook Parkway, from G. L. Rugo & Sons, Inc., 80 Boylston St., Boston, **$1,631,711.** M. A. Dyer Co., 8 Beacon St., Boston, archt., CD 2/7—ENR 2/17.

N. J., Pennsville—Lower Penns Neck Twp. Bd. Educ., Pennsville, Mar. 3, school from John McShain, 832 Prospect St., Trenton, **$664,820.** CD 2/25.

Pa., Uniontown — Bd. Educ., North Union Twp., Union town, rejected bids Feb. 21, 2 story bsmnt., 128x138 ft. brick, high school addn., concrete slab, steel joist roof constr., Coolspring St. Est. **$300,000.** CD 1/27—ENR 2/3.

CONTRACTS AWARDED

Calif., El Monte — El Monte Union High School Dist., El Monte, two, 75x200 ft. frame stucco Rosemead High School classroom bldgs., to R. H. Parr & Son, 4909 Exposition Blvd., Los Angeles, **$349,867.** Bids 2/28.

N. Y., Jamestown—Bd. Pub. Utilities, City Hall, foundation work for Municipal Light and Power Plant to L. H. Ludwig & Co., 20 W. Main St., Falconer, **$259,835.** Bids 2/1. CD 1/10—ENR 1/27.

Pa., Woodville—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general constr., remodeling female mental bldgs., Wards 1 to 8, inclusive at Woodville State Hospital to Allegheny Building & Supply Co., 899 Bingham St., Pittsburgh Zone 3, **$576,800.** Est. $820,000. Bids 2/2. Awarded 3/3. CD 2/8—ENR 2/17. under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

March 19

Ont., Smooth Rock Falls — C. B. Dolphin, archt., 415 Eastern Ave. Toronto, 50x174 ft. concrete, stone, brick hospital, for owner, $250,000.

March 29

Ala., Mobile—Brothers of Sacred Heart, c/o William R. Burk, archt., Pan American Bldg., New Orleans, La., 3 story church. CD 9/21—ENR 10/21.

About April 1

Pa., Doylestown — Our Lady of Mt. Carmel R. C. Church, E. State St., plans by Thomas Henry Moran, Hillcrest Estates, Princeton, N. J., school. $250,000.

April 4

N. J., Cape May Courthouse — Burdette J. Tomlin Memorial Hospital Fdn., Cape May Courthouse, hospital. $700,000. Raymond R. Chatfield, 324 W Chelten Ave., Phila., Pa., archt. CD 6/14—ENR 6/17.

April 11

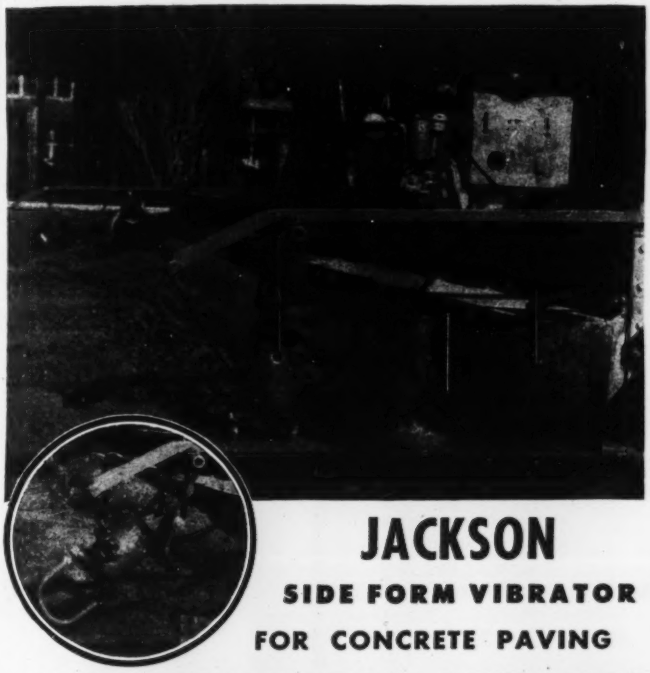
Calif., Patterson — Patterson Community Hospital, S. 8 St., 26 bed frame hospital, $350,000. Plans deposit $100. Douglas Stone & Louis B. Mulloy, 619 California St., San Francisco, archts. CD 3/10/48—ENR 4/1/48.

June or July

Mo., St. Louis—Josephine Heitkamp Memorial Hospital, 1640 S. Grand Blvd., Zone 4, 3 story, brick, concrete, steel hospital, Grand Blvd. and Lafayette Ave. Maguolo & Quick, 4908 Delmar Blvd., Zone 8, archts. CD 4/24/46—ENR 5/9/46, under Mo., Affton.

SOON LETS CONTRACT

Fla., Leesburg — First Baptist Church, Leesburg, soon lets contract church addn. $250,000. Arthur L. Williams, 148½ S. Beach St., archt.



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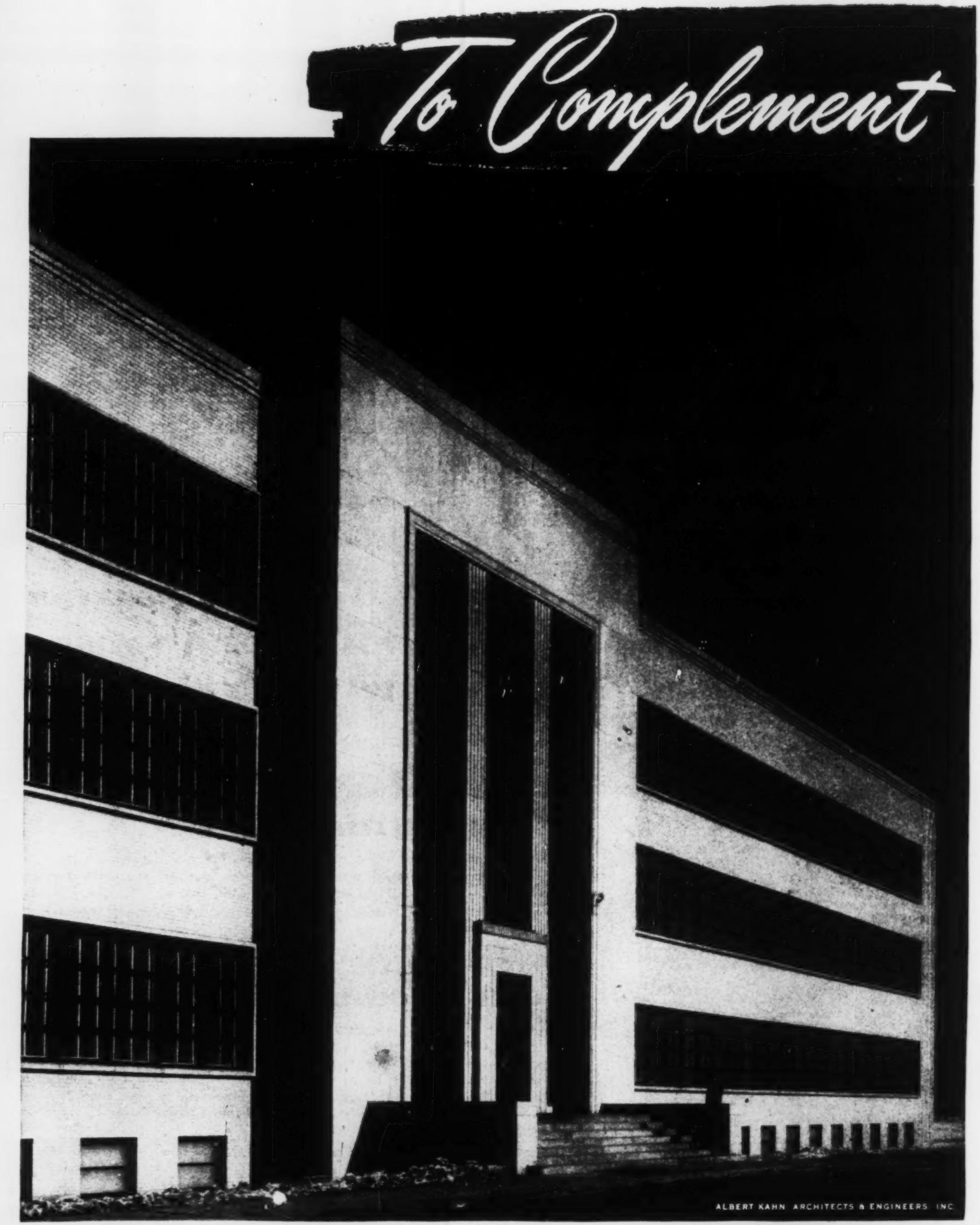
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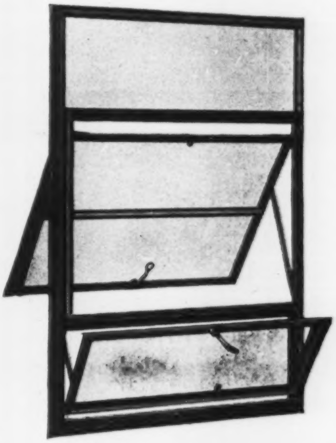

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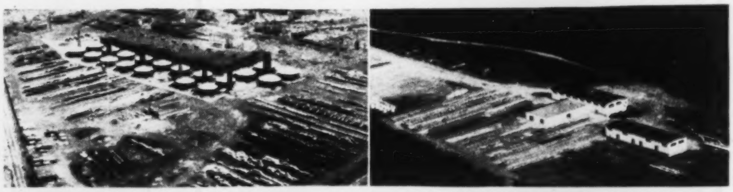

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CONSTRUCTION REPORTS–Second Section

Third Section Construction Reports on page 348

WATER SUPPLY

BIDS ASKED

March 28

Ind., South Bend—City Water Wks. Bd., F. J. Bruggner, chn., 224 N. Main St., WW imprvs., incl., Contr. 7, 5,200 ft. watermain, Ohio and Sample Sts., Contr. 8, 9,300 ft. 10- and 20-in. c.l. watermain, Corby St., Contr. 9, 5,000 ft. 12-in. c. l. watermain, N. W. Main St., Contr. 10, rein.-con. reservoir, $950,000. Plans deposit $10. Chas. W. Cole & Son, La Salle St., consult. engrs., CD 12/1—ENR 1/6.

March 29

Calif., Antioch—State Div. Architecture, P Wks. Bldg., Sacramento, water, sewer and gas services for 23rd District Agricultural Assn. Anson Boyd, state archt.

March 30

O., Mansfield—City, E. T. Garrison, Service Safety Dir., Clearfork Pumping Station. $136,000. Plans deposit $10. Installing pumps, pipes, valves and misc. materials. $12,000. Plans deposit $5. Jennings Lawrence Co., 12 N. 3 St., engr. CD 9/13/45—ENR 9/27/45.

Tex., Muleshoe—City, WW, elevated steel water storage; c. i. mains; supply well, etc. $45,000. Plans deposit $25. Hasie & Green Engr. Co., P. O. Box 1139, Lubbock, engrs.

April 4

●**Calif., Los Angeles**—City Dpt. Water & Power, 207 S. Broadway, Franklin-Baldwin Trunk Line, incl. approx. 48,000 ft. 57 in. I.D. pipeline and appurtenances, Alt. 1, rein.-con. cylinder pipe; Alt. 2, steel pipe cement mortar lined and coated; Alt. 3, steel pipe lined in place; Est. over **$2,000,000.** Baldwin Outlet Line, incl. approx. 36,000 ft. pipeline and appurtenances 54, 60 and 66 in. pipe, Alt. 1, rein.-con. cylinder pipe; Alt. 2, steel pipe cement mortar lined in coated; Alt. 3, steel pipe line in place, est. over **$1,500,000.** S. B. Morris, ch. engr. and genl. mgr. CD 1/15/45—ENR 1/25/45.

April 5

N. M., Raton—City, water distributing sys. addns. Over $28,000. Alfred J. Ryan, 1340 Glenarm Pl., Denver, Colo., consult. engrs. CD 4/22—ENR 5/13.

April 7

N. C., Winston-Salem—City, Ralph L. Dixon, secy., Bd. Alderman, Winston Salem, WW imprvts., Contr. 1 and 2, 36 in. diameter water transmission main from Yadkin River at Idol to Salem Filter plant, 68,000 lin. ft.; Contr. 3 and 4, 8,800 lin. ft. 48 in. diameter water transmission main from Salem Reservoir to Salem filter plant; Contr. 5 and 6, intake structure and pumping station; Contr. 8, 725,000 gal. standpipe at Station 150 plus 00 along transmission main; Contr. 9, 10, 11, 12 and 12 A; alterations and addns. to existing 12 mg. filter plant and pumping station, enlarging to 20 m.g. plant; Contr. 13 and 14, cement lined c. l. water supply and distr. sys., piping. Contr. 22, 1 m. gal. elevated storage tank. John D. Springs, Nissen Bldg., and Albright & Friel, Inc., 1528 Walnut St., Phila., Pa., consult. engrs. CD 11/12/47—ENR 11/27/47.

April 19

Va., Portsmouth—At office W. Guy Ancell, city mgr., Portsmouth, Proposal 1, reconstructing filter bldg. and piping; Proposal 2, filter equip. for filters 1 to 10 inclusive, hydraulic operating valves, equip. for filters 11 to 18 inclusive; Proposal 3, combination proposal incl. work covered by Proposals 1 and 2, Proposal 4, wash water tank and columns on fdn. by others. Proposal No. 5, chemical conveyor equip. Plans deposit $25. Wiley & Wilson, 905 Peoples Bank Bldg., Lynchburg, consult. engr. CD 12/10/45—ENR 1/3/46.

LOW BIDDERS

Ariz., Phoenix—City, 1 Ave. and Washington St., installing 6,200 ft. 60 in. con. watermains on main city line near Scottdale pumping station, from Vinson Constr. Co., 2020 West Grant St., Phoenix, **$214,252.** R. Gail Baker, 1 Ave. and Washington St., engr.

Md., Hyattsville—Washington Suburban Sanitary Comn., 4017 Hamilton St., Mar. 8, Contr. 626-W, incl. 70,000 ft. 6- and 8-in. class 150 c. l. water pipe, from McWane Cast Iron Pipe Co., 1201 Vanderbuilt Rd., Birmingham, Ala., **$137,600**; Contr. 627-W, 10,500 ft. 12- to 20-in. class 150 c.i. water pipe, from U.S. Pipe & Foundary Co., Lincoln—Liberty Bldg., Phila., Pa., **$58,610.** CD 3/3.

Pa., Selinsgrove—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Mar. 9, general constr. water distr. sys. addns. at Selinsgrove State Colony for Epileptics from The Albert Boyer Constr. Co., 236 Queen St., Northumberland, $27,449***standpipe from Pittsburgh-Des Moines Steel Co., Neville Island 25, Pittsburgh, $22,400***watermains and appurtenances from Corbit's Inc., Reading, $42,865. CD 2/15—ENR 2/17.

†**Tex., Camp Hood (P. O. Killeen)**—U. S. Eng., 606 Santa Fe Bldg., Galveston, Mar. 2, WW imprvs., Inv. Eng-41-243-49-181 from N. R. Smith, P. O. Box 140, Bryan, **$34,995.** CD 2/15—ENR 2/17.

CONTRACTS AWARDED

Ariz., Phoenix—City, 1 Ave. and Washington St., installing watermains in Annexed area, to J. H. Welsh & Son, 805 South Central Ave., Phoenix, **$254,092.** R. Gail Baker, City Hall, city engr.

Ill., Caseyville—Village, Edward E. Kraemer, village clk., watermain extens., Hollywood Dist., north of city limits, incl. 2- to 6-in. mains, to W. L. Hall Constr. Co., Atwood, **$98,000.**

●**Mich., Benton Harbor**—City, City Hall, water filtration plant, to Pearson Constr. Co., 240 W. Brittain Ave., 4,100 ft. 36-in. steel intake line installation to Luedtke Engrg. Co., Frankfort. Total, **$1,789,000.** Bids 12/16—ENR 12/8.

†**North Dakota**—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, dismantle, shipment and re-erect elevated storage tank, for Garrison Dam Dist. Eng-32-015-49-66 to W. E. Caldwell Co., 200 E. Brandeis St., Louisville, Ky., **$59,556.** CD 2/9.

Tex., Bellaire—Homecrafters, Inc., c/o Edward M. Hovas, 324 Hughes St. or 714 Milam St., Houston, water and sanitary sewer lines, street paving. Own forces. Approx. **$75,000.** CD 1/4—ENR 1/27.

Tex., Houston—Dr. C. Paul Harris, 3821 Caroline St., waterlines and facilities. Own forces. **$30,000.**

Tex., Houston—Highland Village Corp., 3713 Inwood St., c.l. waterlines. Own forces. **$40,000.** Howe & Wise, 4119 San Jacinto St., engrs.

Tex., Houston — Martin Nadelman, 5305 Blythewood St., c. i. waterlines and facilities. Own forces. **$40,000.** Knostman & Webster, 2017 W. Gray St., engrs.

B. C., Campbell River—Village Comns., Village Hall, WW sys., to G. W. Ledingham & Co. Ltd., 1025 W. 77 Ave., Vancouver. Approx. **$43,000.** Bids 3/1. Awarded 3/5. CD 2/15—ENR 2/17.

●**Que., Montreal** — Municipality, water intake Lachine Rapids, to Atlas Constr. Ltd., 4781 W. St. Catherine St., **$3,080,000.** H. A. Gibeau, city engr., CD 11/29—ENR 12/2.

SEWERS, WASTE DISPOSAL

BIDS ASKED

March 21

B. C., Burnaby—C. B. Brown, municipal clk., Municipal Hall, Edmonds, 27,000 ft. 4- to 12- in. vitr. clay pipe sewers, 91 manholes, sewer system, Willingdon Heights area, $100,000. Plans deposit $25., F. C. Stewart, 207 W. Hastings St., Vancouver, engr. CD 9/7—ENR 9/16.

March 22

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, storm and sanitary sewers, E. 98 St., from Avenue L to sewer summit 320 ft. south of Avenue K. CD 5/17—ENR 5/27.

March 29

Calif., Los Angeles—Bd. Supervs., Los Angeles Co., 501 Hall of Records, sanitary sewers in Rio Hondo Ave., and other streets, 3.64 mi. 8 to 15 in. sewer pipe, vicinity of Resemead. C.I 1207, $90,350. C. E. Arnold, co. surv. and engr.

March 30

Ala., Enterprise—City, Enterprise, sewage disposal works and sewer lines. Plans deposit $50. R. L. Kenan & Assoc., Bell Bldg., Montgomery, engrs.

Calif., Los Angeles—City Bd. P. Wks., 152 City Hall, sanitary sewer in De Soto Ave. and Sherman Way Sewer Dist., 8 and 33 in. sewer pipe, $168,797. CD 10/2—ENR 10/7.

Tex., Muleshoe—City, sanitary sewers, incl. collection lines, 3 lift stations, force mains, imhoff tank. $65,000. Plans deposit $25. Hasie & Green Engr. Co., P. O. Box 1139, Lubbock, engrs.

March 31

Tex., Angleton—City, Carlos Masterson, mayor, Angleton, sewage disposal plant. $115,000. Plans deposit $25. Garrett Engr. Co., 5008 Almeda Rd., Houston, engr. CD 1/5—ENR 1/20.

April 1

Wis., Delavan—City, sewage treatment plant. Plans deposit $10. Jensen & Johnson, Elkhorn, engrs. CD 2/8/45—ENR 2/22/45.

April 6

Pa., Lemoyne—Lemoyne Boro, 332 Herman Ave., sewerage sys. incl. 58,000 lin. ft. 8 to 18 in. vitrified sewers; 24,000 lin. ft. 6 in. vitrified sewer house connections; 240 brick manholes; sewage treatment plant, incl. control bldg., primary settling tanks, sludge digester, sludge drying bed, chlorine contact tank, fencing, etc. Plans deposit $20 for sewerage sys. $15, sewage treatment plant. Gannett, Fleming, Corddry & Carpenter, Inc., 600 N. Second St. Harrisburg, consult. engrs. CD 6/14/46—ENR 6/27/46.

LOW BIDDERS

Ala., Wetumpka—City, Mar 7, extending sanitary sewers, from Seabee Constr. Co., Tuscaloosa, **$105,752.** CD 2/21—ENR 2/24.

Colo., Colorado Springs—City, R. F. Sonnekson, city clk., City Hall existing municipal sewage treatment plant, addns., alterations, from Raymond C. Whitlock, 2719 Cascade Ave. **$107,900,** est. Over $50,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., archts. and engrs.

R. I., Warren—Town, Felix Brocu, Comrs. Sewers, Town Hall, rejected bids Feb. 10, sewage treatment plant, incl. grit chambers, chlorinators, sludge pumphouse, etc. L. B. **$285,900.** CD 3/1—ENR 3/3. under LB.

Tex., San Antonio—City, Mar 3, relief sanitary sewer, S. Alamo and S. St. Marys to Broadway and 12 Sts. from Walsh Constr. Co., Electra, **$199,329.** Est $149,000. CD 2/18—ENR 2/24.

Wis., Monroe—City, Feb. 23, general constr. sewage treatment plant addn. from E. M. Scheflow, Elgin, Ill., **$188,500.** CD 1/25—ENR 1/27.

CONTRACTS AWARDED

Colo., Aurora—City, Aurora, sewer constr proj. in 8 block area, extending on south side of center of Colfax Ave. from Akron St. to Emporia St., cutoff with extend north of Akrron St. to empty water in Sand Creek north of city, to Birchby & Nauman Constr Co., 1750 Jasmine St., Denver, $66,000, est Over **$50,000.**

Tex., Houston—Dr. C. Paul Harris, 3821 Caroline St., sanitary sewers, draining and grading. Own forces. **$65,000.**

Tex., Houston—Highland Village Corp., 3713 Inwood St., sanitary sewers and drainage Own forces. Approx. **$60,000.** Howe & Wise 4119 San Jacinto St., engrs.

Tex., Houston—P. C. Stewart, 5308 Carrollton St., drainage between Askew and Golfcrest Blvd. along Gulf Freeway. Own forces. **$60,000.**

B. C., Penticton—City, City Hall, 5 mi concrete sewer mains, laterals, to G. W Ledingham & Co. Ltd., 1025 W. 77 Ave. Vancouver, **$65,358.** Awarded 2/28. W. E Warburton, city engr. CD 4/13—ENR 4/29

BRIDGES

BIDS ASKED

March 23

Ia., Emmetsburg—Bd. Supervisors, Palo Alto Co. Court House, Emmetsburg, concrete superstructure, treated piling substructure, 24x32 ft. skew I-beam bridge, T. R. Martin, co. engr.

March 29

†**California**—U. S. Eng., Wright Bldg., Sacramento, bridge and weir for Pine Flat Project near Piedra, Spec. 1341.

N. Y., Delhi—at office Malcolm MacPherson, Supt. Delaware Co., Page Ave., Contr. No. 1, Dunraven-New Kingston County Rd. Proj No. 46, 0.1 mi. roadway, superstructure abutments and approaches, grading and foundation course, Bridge 6-1. Est. $52,990; Contr No. 2, East Masonville-Sidney Center County Road, Proj. No. 48, 0.02 mi. superstructure abutments and approaches, grading and foundation course Bridge 35-1. Est. $15,514 Plans deposit $10 each. adv. ENR 3/10.

LOW BIDDERS

New Jersey—State Hy. Comn., Spencer Miller, Jr., Comr., Trenton, Mar. 9, constructing Federal St., in city of Camden, Camden Co. from John F. Lafferty, Chapel Ave., Haddonfield, **$276,263.** CD 2/17—ENR 2/24.

New York—Dpt. P. Wks., Bertram D. Tallamy, supt., Alfred E. Smith State Office Bldg., Albany, Mar. 9, 0.36 mi. Fort Plain Village-Hancock St. Pt. 2, S.H. 9277, Fort Plain-Canajoharie S.H. 8345, Fort Plain Village-Hancock St. S.H. 1866. FG.RC. 49-27 Montgomery Co. from Howes & Farrell, Wampsville St., Oneida, **$378,368.** Est. $393,000. CD 2/18—ENR 2/24.

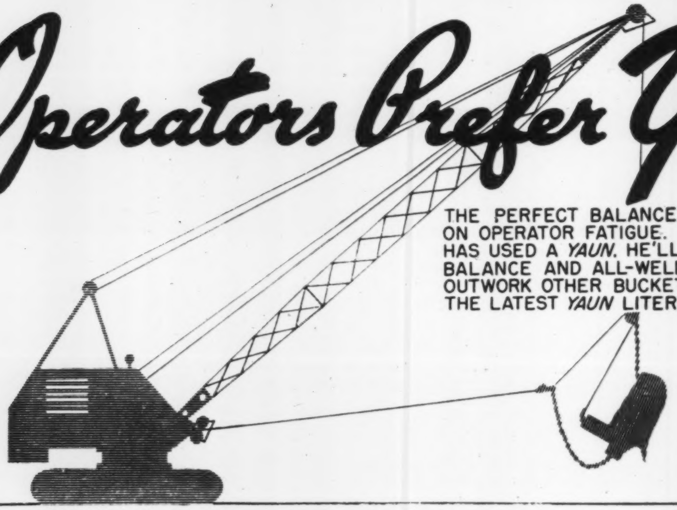
Oregon—State Hy. Dpt., State Office Bldg., Salem, rejected bids Mar. 1, constructing 2 rein.-con. bridges and 0.57 mi. highway roadbed on Sandy Creek and Rock Creek Bridge sects. of Coos Bay-Roseburg Hy. FAP F-151 (1) and F-29 (2). Douglas Co. L.B. **$119,101.**

†**Virginia**—Pub. Roads Admin., 1440 Columbia Pike, Arlington, Mar. 8, 33.651 mi. Blue Ridge Parkway, Proj. 185-J3-K8, Bedford Rockbridge and Botetourt Counties from Robertson-Henry Co., Huntington, W. Va., **$360,993.** CD 2/11—ENR 2/17.

CONTRACTS AWARDED

Kan., Kansas City—City, City Hall, Central Ave., viaduct, to George Bennett Constr. Co., 1520 Central Ave., Kansas City, **$849,693.** Bids 2/17. CD 3/1—ENR 3/3. under LB.

Operators Prefer Yaun



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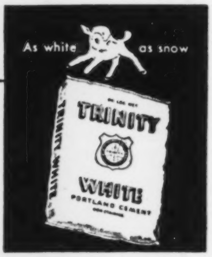

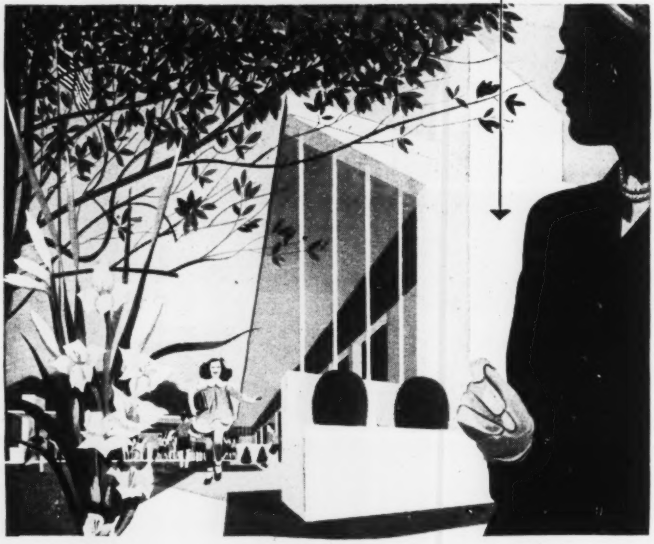

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TRINITY WHITE PORTLAND CEMENT

†**Mississippi** — P. Rds. Admin., 305 **Medical Arts Bldg. Florence, Ala.,** concrete **overpass box culvert, Proj.** 3L2, Natchez Trace Parkway, to **Baird & Latimer,** Selma, Ala., **$176,944.** Bids **3/4.** CD **2/10—ENR** 2/17.

●**New York**—Bureau Contracts & **Accounts,** Albany, **grading** 0.28 mi. Bronx River Parkway and **3 bridges** in vicinity of Gun Hill **Rd.,** Bronx Co. to Lawrence J. Rice, Inc., **30** Deepdon Rd., Forest Hills, **$1,318,961.** Bids 1/12. CD **1/14—ENR** 1/20, under LB.

North Dakota—State Hy. Dpt., **Bismark,** Mar. 4, 1.054 mi. underpass structure, **air-entrained** Portland cement, concrete **paving,** b. conc. etc. St. Hy. No. 14 in Towner, FAGM-390 (10), McHenry Co. to Okes Constr. Co., E. 1501 1st. Natl. Bank Bldg., St. Paul, **Minn.,** **$361,666.** CD 2/18—ENR 2/24.

Oregon—State Hy. Comn., State **Office** Bldg., **Salem, construct** 233 ft. rein.-con. **viaduct and 0.37 mi. highway** roadbed on **Marhs** River **Bridge sect.** of Kings Valley Hy., **FAP** S-38 (2) **Benton** Co. to Lindstrom Bros., **7335** N. E. **Broadway,** Portland, **$74,967.** Bids **3/1.**

Oregon—State Hy. Dpt., State Office **Bldg.,** Salem, **constructing** 3 rein.-con. **bridges and** 0.8 mi. **highway** roadbed on Shields **Creek** and **Looking-glass** Creek bridge sect. of **Coos** Bay-Roseburg Hy., FAP F-29 (4), **Douglas** Co. to Lindstrom Bros., 7335 N. E. **Broadway,** Portland, **$180,022.** Bids 2/28.

Pa., Phila.—Dpt. P. Wks., City Hall **Annex,** Contr. B-106 Walnut Lane Bridge to Henry W. Horst Co., 15 and Race Sts., **$698,383.** CD **1/26** —ENR **2/3.** under LB.

Tex., Houston—Dr. C. Paul Harris, 3821 Caroline St., roads and streets. Own forces. **$55,000.**

Tex., Houston—Highland Village Corp., **3713** Inwood St., street paving. Own forces. **$55,000.** Howe & Wise, 4119 San Jacinto St., engrs.

Saskatchewan—Dpt. Hys. & Transportation, Regina, substructure 1,200 ft. traffic **bridge** over South Sasketchewan River, 2 mi. **north** Swift Current, to Bird Constr. Co. **Ltd.,** Seventh and Smith St., Regina. **Approx.** **$588,269;** steel to Dominion Bridge Co. Ltd., Lachine, Que. Approx. **$148,500.** Bids **2/18.** CD 1/14—ENR 1/20.

STREETS AND ROADS

BIDS ASKED

March 21

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone **2,** reflagging west side of Bedford Ave. and 15 other locations; curbing and flagging, Glenwood Rd. and reflagging 18 other locations; b. conc. on. 6 in. concrete base, E. 29 and E. 32 Sts.; furnishing and erecting chain link fences east side of Dahill Rd. and 25 other locations. CD 8/28/44—ENR 9/7/44.

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, **grading** E. 98 St. **from** Avenue L to **Avenue K.**

March 23

Colo., Denver—City and County of Denver, Thomas P. Campbell, mgr. Imp. & **Parks,** City and County Bldg., Denver, reconstr. 6 and 7 **Aves.,** from Broadway east to **Pennsylvania** on E. 7 Ave., south of **Pennsylvania** and **east** of E. 6 Ave. to Monroe St. Terry Owens, City and County **Bldg.,** city engr.

March 29

N. Y., Woodside—New York City **Housing** Auth., 63 Park Row, New York Zone 7, **street** and yard imprvs. for Woodside **Houses,** Proj. No. NYC-5, in area bounded by **31** Ave., **51** St., Northern Blvd., Newton Rd. and **49** St., **Queens** Boro. Plans deposit $25.

March 31

†**S. C., Parris Island (Ind. Br. Beaufort)**—Officer Charge of Constr., Parris Island, **paving** road to Golf Club House and Ribault Monument area at Marine Corps Recruit Dept. Noy 17150. Spec. 21032. Plans deposit $10.

April 1

Ky., Whitesburg—Letcher Co., **Whitesburg,** grading, draining 27 mi. roads.

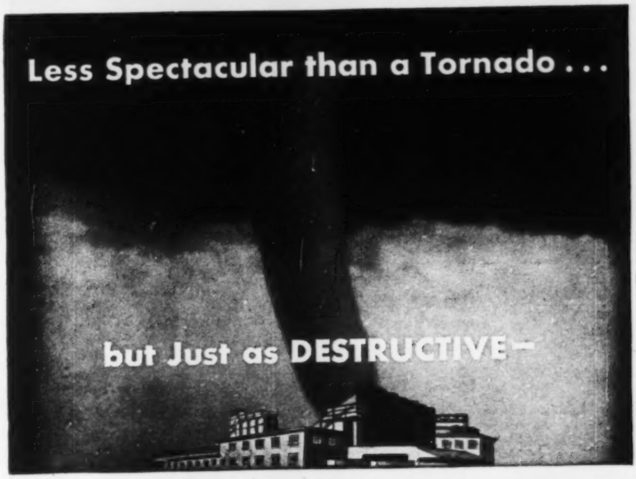
April 4

Calif., Martinez—Contra Costa Co., Hall of Records, portion of Kirker Pass Hy., **County** Rd. D-5, over $50,000. Plans deposit **$15.** Joseph W. Barkley, Hall of Records, **engr.** CD 11/18—ENR 12/9.

LOW BIDDERS

Arizona—State Hy. Comn., Phoenix, **Mar.** 4, base material and bit. road mix 1 mi. beginning about 5½ mi. northwest of Clifton and exten. northwesterly toward. **Morceni,** C-59(3) AFE 704, Clifton-Morceni Hy., **from** Peter Kiewit Sons Co., 1950 S. Colorado **Blvd.,** Denver, Colo. **$245,445;** grading, **draining** roadway over improved alignment 1 mi. beginning about 4 mi. nortwest of Clifton **and** extending northwesterly along Chase **Creek** NON-FAS 101 (1940) AFE 6604, **Clifton-**Springerville Hy., from Packard Constr. **Co.,** Luhrs Tower, Phoenix, **$164,315.** CD **2/26.**

●**New York**—Dpt. P. Wks., Bertram **Tallamy,** supt. Alfred E. Smith State Office Bldg., **Albany,** Mar. 1, 6.31 mi. **Palenville-Catskill S. H.** **8231, Catskill** Thruway (Ulster County **Line**



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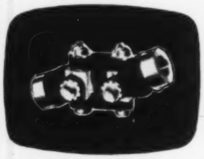

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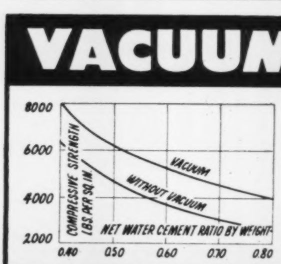

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Brick School House C. T. 46-2; Brick School House Rd. to S. H. 8231, C. T. 3, Saugerties-Catskille, Pt. 3, S. H. 5027, FA. RC. 49-25, C. T. R. C. 49-22, RC 49-24, Greene Co. from The Lane Constr. Corp., 37 Colony St., Meriden, Conn., **$1,336,522*****10.94 mi. Woodbourne-Ellenville, Pts. 1, 2A and 2B, S. H. 49-4, S. H. 49-6 and S. H. 49-7, Ulster and Sullivan Counties and 1.49 mi. South S. H. 223, FA. RC. 49-1, Dutchess Co. from Berlanti Constr. Co. Inc., 15 Oakland Ave., Harrison, **$1,296,936.** Est. $1,346,000 and **$432,345.** Est. $465,000 respectively ***0.62 mi. Cross Bronx Expressway (Contr. 10E), F. A. CBE. 49-1, Bronx Co. from Tully & DiNapoli, Inc., 164 St., and Gull Contrg. Co. Inc., 187-02, 50 Ave., Flushing, **$3,993,382.** Est. $4,281,000***3.13 mi. Finchville-Smith Corners County Rd., 35, FA. SS. 49-11, Orange Co. from Green Island Constr. Co., Green Island, **$184,989.** Est. $206,000***2.1 mi. Waterville-New Hartford, Pt. 2, S. H. 8298, Utica-Oneida, Pt. 1, S. H. 250 New Hartford Village, S. H. 5052, FA. RC. 49-14, Oneida Co. from E. G. DeLia & Sons Constr. Corp., New Hartford, **$528,456.** Est. $561,000***received no bids Mar. 9, 0.72 mi. Major Deegan Expressway (Contr. 1A) FA. MDE. 49-1, Bronx Co. Est. $2,116,000. CD 2/18—ENR 2/24.

Oregon—State Hy. Comn., State Office Bldg., Salem, rejected bids Feb. 28, Rainrock-Alderwood Park rock production proj. on Suislaw and Alsea-Deadwood Hy., Lane Co. L. B **$145,000*****0.66 mi. paving, minor grading, Troutdale Sect. of Columbia River Hy. FAP FI-301 (3), Multnomah Co. from C. T. Malcom & Co., 4085 N. Columbia Blvd., Portland, **$134,281.**

Oregon—State Hy. Comn., State Office Bldg., Salem, Mar. 1, grading surfacing, oiling, furnishing 4,200 cu. yd. crushed gravel for Snider Creek-Crater Lake Junction sect. of the Sams Valley secondary Hy., FAP S-52 (1) and FAS 52 (2), Jackson Co. from Walter Berndt Constr. Co., Vancouver, **$211,458.**

CONTRACTS AWARDED

Arizona—State Hy. Comn., Phoenix, grading, draining 5 mi. State Hy. 75 over new Alignment east of Safford to R. H. Martin Constr. Co., **$187,000.** Bids 2/9, awarded 3/1 CD 2/9.

Calif., Pasadena—City, Pasadena, resurfacing 33 streets, Bella Vista Ave. and others, to Griffith Co., 1060 S. Broadway, Los Angeles, **$66,040.** Bids 1/31, awarded 2/23. CD 11/15/44—ENR 11/30/44.

Ia., Emmetsburg—Bd. Supervisors, Palo Alto Co., Court House, Emmetsburg, 80,000 cu. yd. grading, 314,000 cu. yd. class 10 excavating, 34 mi. secondary county roads to Adolph G. Anderson, Spencer, **$73,880.** T. R. Martin, co. engr.

Nebraska—State Dpt. Road and Irrigation, Lincoln, c. conc. State Road 224-D and 296-B within town of Ogallala, Keith Co. to Case Co.-Contractors, Ogallala, **$50,352.** Bids 3/3 CD 2/14—ENR 2/17.

●**New Jersey**—State Hy. Dpt., Trenton, cross connection, grading, State Street Bridge and retaining walls, Rt. 26 Extens., Sect. 1-B, Mercer Co. to Franklin Contrg. Co., 12 Central Ave., Newark, **$1,373,814.** Bids 2/10. Awarded 3/8. CD 2/14—ENR 2/17, under LB.

North Dakota—State Hy. Dpt., Bismarck, base, b. conc. etc., 19.934 mi. St. Hy. No. 25 from Hanover north and Stanton west, F-686 (2), F-235 (12) and S-135 (2) Mercer and Oliver Counties to Northwestern Engr. Co., Rapid City S. D., **$448,748.** Bids 3/4. CD 2/18—ENR 2/24

Oregon—State Hy. Comn., State Office Bldg., Salem, grading, surfacing and oiling 5.65 mi Sheeley Bridge-Sunset Camp Sect. of Upper Nehalem county road, FAP S-279 (2), Columbia and Washington Counties to Homer G Johnson, 3166 N. Greeley St., Portland, **$138,889.** Bids 2/28.

Tex., Houston—Harris Co., c/o Hugh A May, Comr. Precinct 2, Courthouse, road constr. incl. asph. resurfacing, 2.2 mi. Wolff Rd.; 2.47 mi. Crosby-Huffman Rd., force-account. **$78,000.** Hugo Zaoo, county engr CD 8/28/47—ENR 9/18/47.

Tex., Houston—P. C. Stewart, 5308 Carrollton St., street paving, hard surfacing. Own forces Approx. **$70,000.**

Wisconsin—State Hy. Comn., Madison, c. conc. and bit. 12.296 mi. Beaver Dam-Waupun Rd., U. S. Hy. 151, Contr. 1, Proj. T 017-2 (3) to Rock Road Constr. Co., 5915 Rogers Ave., Chicago, Ill., **$547,248.** CD 3/7—ENR

Ave., Chicago, Ill., **$547,248.** CD 3/7—ENR

Alta., Edmonton — Municipality, paving, to Crown Paving & Constr. Co. Ltd., 7-104 Ave., **$534,987.**

EARTHWORK, WATERWAYS

BIDS ASKED

March 21

●**Ont., Ingersoll**—W. H. Porter, secy., c/o Upper Thames Valley Authority, 1,400,000 cu. yds. excavation, rip-rap, channel imprv. south branch Thames River from Beachville through Ingersoll, approx $1,000,000. G. G. Reid, 264 Avenue Rd., Toronto, engr., CD 2/28—ENR 3/17.

March 25

✝**Missouri**—U. S. Eng., 826 U. S. Court House, and Custom House, 1114 Market St., St. Louis, Zone 1, levees, Perry Co. Levee Dist. 1, 2 and 3, Proj., Item II-A, Perry Co., Serial No. Eng. 23-065-49-112. CD 3/2—ENR 3/10.

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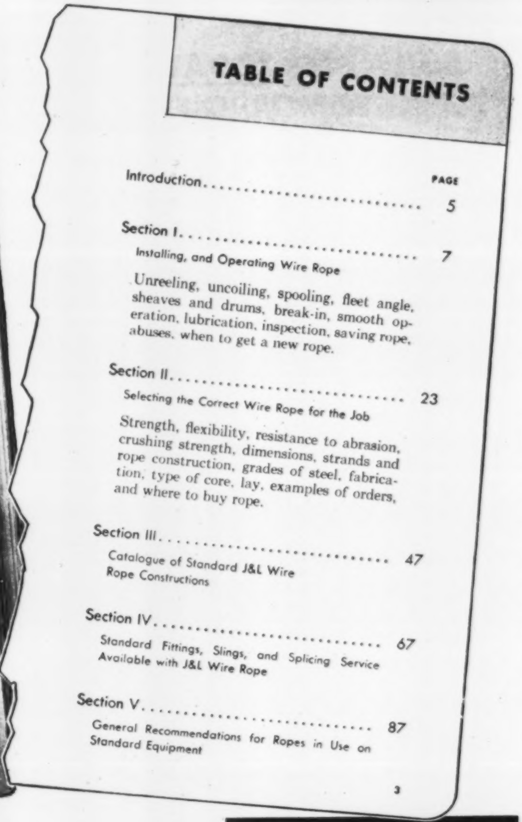

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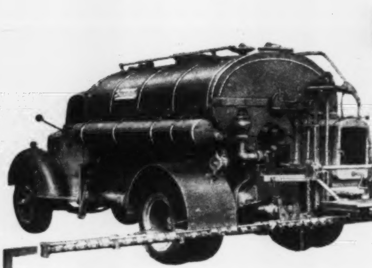

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March 28

†Washington — Bureau Reclamation, Dpt Interior, Coulee Dam, constructing draft tube bridge ramp extens. and footings for river crossing towers for power feeder No. 4. Spec. B-CB-18 (Region 1), Columbia Basin Proj.

March 30

P. E. I., Souris—J. M. Somerville, secy. c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater repairs, approx. $50,000. Plans deposit $20. R. Blais, c/o owner, engr.

March 31

†Oregon—U. S. Eng., 19 E. Poplar St. Walla Walla, Wash., design, fabrication and delivery of one metal-enclosed power center and two metal-enclosed weather-proof control stands for McNary Dam. Serial No. Eng 45-164-49-32. Extended date. CD 3/2—ENR 3/10. Under State of Washington.

Ont., Spencerville — A. Rodgers, Billings Bridge, dam on South Nation River, incl 9 mi. diversion canal and 4 dams, for South Nation Conservation Authority, Kilburn Engrg Co. Ltd., 13 Adelaide St., Toronto, engrs. CD 12/17.

About April 1

†Illinois—U. S. Eng., 826 U. S. Court House and Custom House, 1114 Market St., St. Louis Zone 1, Mo., levees in Prairie Du Rocher, and vicinity (Item V-B) (Edgar Lakes, Prairie Du Rocher and Modoc Drainage and Levee Dists.) Randolph Co., including 150,000 cu. yd. levee embankment, 10 acres seeding and mulching 1540 cu. yd. tamped backfill, two 66-in. sluice gates, etc.

About April 4

†N. M., Roswell—U. S. Eng., P. O. Box 1538, Albuquerque, clearing approx. 10 acres river channel; channel excavation, approx 50,000 cu. yds. for 2 mi. of new river channel; fence relocation, approx. 20 rods to be removed and replaced. Inv. 29-005-49-68.

April 5

La., Hammond—Tangipahoa Parish School Bd., Amite, Proj. A, alterations, repairs to main bldg., Annie Eastman High School, Proj. B, alterations, addns. to gymnasium bldg. Plans deposit $20. Favrot & Reed, 402 Nola Bldg., New Orleans, archts.

On or About April 6

†Ga., Atlanta—U. S. Eng., Post Office Bldg., Savannah, bldg. alterations, addns., 699 Ponce de Leon Ave.

About April 6

†N. C., Fort Bragg—U. S. Eng., 308 Customhouse, Wilmington, family quarters, Inv. No Eng-31-075-49-35. CD 1/6—ENR 1/20.

April 6

†O., Cincinnati—U. S. Eng., P. O. Box 59, Louisville 1, Ky., constructing Recorder Wells and office, alterations and repairs at pump stations and gates. Contr. No. 2Z Serial No. Eng-15-029-49-20.

April 7

La., Opelousas—St. Landry Parish School Bd., Opelousas, 5 auditorium and gymnasium bldgs. Extended date. CD 1/4—ENR 2/3.

On or About April 9

Pa., Altoona—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Pa., quarters bldg. for Veterans Admin. General Medical Hospital. Serial No. ENG—36-058-49-97.

About April 12

†Kansas—U. S. Eng., 601 Davidson Bldg., Kansas City, Zone 8, Mo., raising stock yard bridge, stock deck revisions, levee fill, slope protection, etc. Kansas City, mile 1.68 on Kansas River. Serial No. Eng., 23-028-49-174.

April 12

Calif., Calexico—Calexico Elementary School Dist., classrooms and administration bldgs., Rockwood School, $388,000. Plans deposit $10. Bowen, Rule & Bowen, 2853 Gilroy St., Los Angeles, 26, engrs. CD 11/8—ENR 12/9.

Miss., Forest — Scott Co., hospital. $348,000 E. L. Malvaney, Millsaps Bldg., Jackson archt.

†Virginia—U. S. Eng., foot of Front St., Norfolk Zone 1, dredging Eastern Branch of the Elizabeth River, Norfolk Harbor, Serial No. Eng-44-110-49-27.

April 13

†Tenn., Oak Ridge—U. S. Atomic Energy Comn., P. O. Box 365, Attention Community Constr. Sect., Oak Ridge, constructing 286 duplex dwellings units, in Neighborhood No. 10. Inv. No. 401-49-10A. Plans deposit $25 CD 2/23—ENR 3/10.

About April 14

†Kentucky—U. S. Eng., 303 U. S. Court House, Nashville, Tenn., clearing segments Group 3, Wolf Creek Reservoir, Wayne Pulaski, McCreary, Laurel and Whitley Counties. Serial No. Eng. 40-058-49-71. CD 6/9/41—ENR 5/12/41.

About April 18

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, constructing Bldg A-17, Sandia Base. Serial No. 291-49-90. Plans deposit $45.

April 25

†Mississippi—U. S. Eng., P. O. Box 60, Vicksburg, pumping station, incl. pumps, equip., floodgates, intake and outlet channels, approx. 800 ft. levee, lower end Walker Lake, 3 mi. southwest of Greenwood, Leflore Co.

About May 31

†Pa., Erie—U. S. Eng., Engineer Park, Buffalo 7, N. Y., residence bldgs., Veterans Admin. Hospital Proj. Serial No. Eng-30-023-49-46.

LOW BIDDERS

●†California—U. S. Eng., 75 S. Figueroa St., Los Angeles, Mar. 4, Los Angeles River Imprvt. Tujunga Wash to Whitsett Ave. River Mile 37.71 to River 38.61, Serial No. Eng-40-353-49-47, from Matich & Yaeger, P. O. Box 390, Colton, **$1,220,694.** CD 2/14—ENR 2/24.

†Georgia—U. S. Eng., P. O. Box 1169, Mobile 7, Ala., Mar. 8, tailrace channel deepening at Allatoona Dam, Etowah River, Serial No. Eng-01-076-49-101, from Carlton Contracting Co., Albany, **$437,151.** CD 3/2.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Zone 9, Mar. 3, rein.-con. walls for Algiers Lock, Serial No. Eng., 16-047-49-116, from Stevens Bros. & Miller Hutchinson Co. Inc., 730 Gravier St., New Orleans, **$927,4421.** CD 2/3—ENR 2/10.

†Pennsylvania—U. S. Eng., P. O. Box 1715, Baltimore 3, Md., Mar. 4, Williamsport Flood Protection Project, Levee Unit No. 2B, Williamsport, Lycoming Co., Inv. No. Eng-18-020-49-53 from Frank Bryan, Inc., 1263 Chartiers Ave., McKees Rocks, **$275,812.** CD 2/28.

Pennsylvania—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, Mar. 8, silt impounding basins on the Schuylkill River, Seyfert No. 1 and Seyfert No. 2 from Williams Constr. Co., Pottsville, **$253,680** and **$198,550** respectively***Oaks Site and North Abrams Site from James D. Morrissey, Inc., Willits and Home Ave., Phila., **$531,097.** CD 2/23—ENR 3/3.

●†South Dakota—U. S. Eng., 1709 Jackson St., Omaha, Neb., Mar. 8, hydraulic turbines for Fort Randall Power Proj. Inv. No. Eng-25-066-49-172 from Allis-Chalmers Mfg. Co., 1126 S. 70 St., Milwaukee, Wis., **$2,500,600.** CD 1/26—ENR 2/3.

●†Tex., San Angelo—U. S. Eng., 606 Santa Fe Bldg., Galveston, completing embankment spillway and service for San Angelo Dam and Reservoir Proj. from Winston Bros. Co., and Taylor-Wheless Co., c/o owners, **$5,644,874.** Est. Over $2,500,000. CD 1/17—ENR 1/20.

†Virginia—U. S. Eng., foot of Front St., Norfolk, Mar. 8, maintenance dredging in the James River from Richmond Deepwater Terminal to Hopewell, Serial No. Eng-44-110-49-142 from Atkinson Dredging Co., Great Bridge, **$206,915.** Est. $206,789. CD 3/2.

CONTRACTS AWARDED

●†Kansas—Bureau Reclamation, Dpt. Interior, Ellis, Cedar Bluff Dam and relocation County road, Missouri River Basin Proj., Spec. 2483, to C. F. Lytle Ct. 505 Nebraska St., Sioux City, Ia., Amis Constr. Co. 1647 Exchange Ave., Oklahoma City, Okla., and San Ore Constr. Co., McPherson, **$11,350,735.** Bids 2/8. Awarded 3/4. CD 2/11—ENR 2/17, under LB.

†Kansas—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., two 4x5 ft. high pressure gates, two 110,000 lb. hydraulic hoists, 2 gate hangers, two 66-in. transitions, conduit lining, Cedar Bluff Dam outlet Wks., Missouri River Basin Proj., Spec. 2515, to Albine Engine & Machine Wks., Inc., 2860 N. W. Front St., Portland, Ore. **$33,917.** Bids 1/27. Awarded 3/4. CD 12/27—ENR 1/16.

CONTRACTS AWARDED

Ont., Kingston—Municipality, 11,800 ft. steel sheet piling at Municipality dock, to Russell Constr. Co. Ltd., Harbour Bldg., Toronto, Approx. **$150,000.** Gore & Storrie, 1130 Bay St., Toronto, engrs., CD 11/5—ENR 11/11/43.

AIRPORTS AND AIRBASES

BIDS ASKED

April 1

Okla., Tulsa—CONTROL TOWER—City, Park Bd., Municipal Bldg., airport control tower. $100,000. Leon B. Senter, Philtower Bldg., archt. CD 1/12/45—ENR 1/25/45.

About April 1

†R. I., Hillsgrove—HANGAR—U. S. Property & Disbursing Officer for Rhode Island, 61 Stenton Ave., Providence, Zone 6, hangar for Liaison Type planes, Theodore F. Green Airport. Plans deposit $10. CD 9/9/43—ENR 9/16/43.

April 5

Colo., Grand Junction—AIR TERMINAL—City, T. I. Moore, city mgr., City Hall, 1 story part bsmnt., 50x194 ft., brick air terminal $70,000. Smith Hegner & Moore, 504 First Natl. Bank Bldg., Denver, archts. CD 1/26—ENR 2/3.

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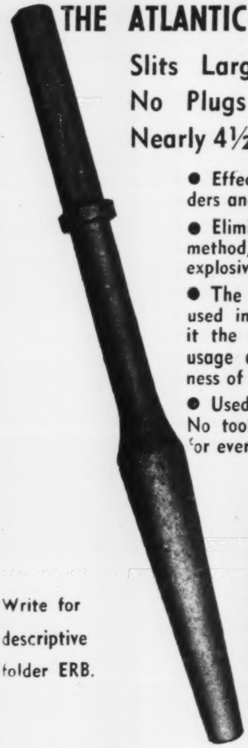

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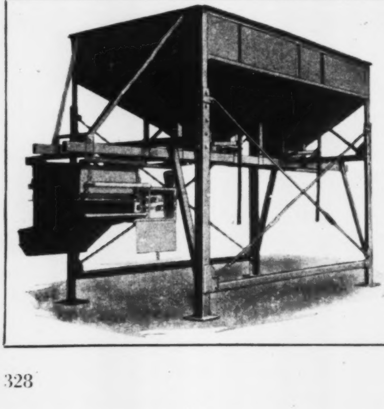

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N. Y., Binghamton—AIRPORT—at office Howard Davis, clk., Bd. of Supervisors, Broome County Office Bldg., paving and other constr. Broome County Airport. Plans deposit $15. S. P. Carman, Security Mutual Bldg., and Seelye, Stevenson & Value, 101 Park Ave., New York, Zone 17, consult engrs. CD 1/14/47—ENR 2/6/47.

April 19

†Neb., Lexington — COMMUNICATION STATION — Civil Aeronautics Administration, City Hall, Kansas City, Mo., interstate airways communication station. CD 5/9/45—ENR 5/17/45.

LOW BIDDERS

Ia., Muscatine—AIRPORT IMPRVS.—City, City Hall airport imprvs., from R. B. Burch, 1718 Park Ave. S. E., Cedar Rapids, **$56,182**. Stanley Engrg. Co., Muscatine, engrs.

CONTRACTS AWARDED

Ill., Murphysboro — AIRPORT — South Illinois Normal University, Carbondale, class II airport, to Caldwell Engrg. Co., Jacksonville, **$203,555.** Norman C. Bird, ch. engr., State Dpt. Aeronautics, Capital Airport, Springfield, engr. CD 8/30/44—ENR 9/21/44, under Ill., Carbondale.

FOREIGN

Ceylon—Ministry of Agriculture and Lands, Secretariat, Colombo, Ceylon, receiving bids on or before March 31, constructing Walawe Ganga Dam and power house 17,500 ft. long, 110 ft high at river bed, concrete spillway controlled by nine 30x40 ft. radial gates and gravity abutment sections in all 875 ft. long and 118 ft high, power house with 3 No. 3750 k.v.a. generators driven by 4,700 h.p. Francis type turbines for an Irrigation Reservoir-cum-Hydro Electric Proj. on Walwawe Ganga, located approx. 100 mi. southeast of Colombo.

PUBLIC BUILDINGS

BIDS ASKED

March 22

†Conn., Ansonia—Office of the U.S.P. & D.O. Connecticut State Armory, Rm. No. 303, Hartford, motor vehicle storage bldg., Extended date. CD 1/28—ENR 2/3.

†Conn., Manchester—Office of the U.S.P. & D.O., Connecticut State Armory, Rm. No. 303 Hartford, constr. motor vehicle storage bldg. Extended date. CD 1/28—ENR 2/3.

†Conn., West Haven—Office of U.S.P. & D.O. Connecticut State Armory, Rm. No. 303, Hartford, constr. motor vehicle bldg. Extended date. CD 1/28—ENR 2/3.

S. C., Varnville—Hampton Co., Varnville hospital. Est. **$250,000.** Extended date. Lafaye, Lafaye & Fair, 1226 Sumter St., Columbia archts. CD 2/17—ENR 3/3.

Que., St. Laurent (P. O. Montreal)—J. J. O'Sullivan engr., 1253 McGill College Ave., 78 duplex dwellings, for Central Mortgage & Housing Corp., 70 Lyon St., Ottawa, Ont., Plans deposit $10.

March 24

Ga., Columbus—City, Columbus, library. Plans deposit $25. Biggers & Lockwood, P. O. Box 34, archts. CD 2/20/48—ENR 3/4/48.

Ia., Onawa—City, City Hall, power plant imprvs., incl. generating equip., switchboard, etc., $85,000. Buell & Winter, 508 Insurance Exchange Bldg., Sioux City, engrs.

N. Y., Long Island City—New York City Housing Auth., 63 Park Row, New York Zone 7, foundations and appurtenances for Ravenswood Houses, Sect. I, Proj. NYC-20 consisting of 17 bldgs. in area bounded by 21 St., 34 Ave., 24 St. and 36 Ave., Queens Boro. Plans deposit $75. Extended date. CD 2/24—ENR 3/3.

March 25

Ala., Mobile—Mobile Bd. School Comrs., c/o J. R. Rutland, archt. 452 Government St., Bayou La Betre School. Plans deposit $25.

Utah, Salt Lake City—State Bldg. Bd., State Capitol, adult center for the blind. $250,000-$300,000. Cannon & Mullen, Templeton Bldg., archts. CD 8/23—ENR 9/2.

Wis., Juneau—Dodge Co., Juneau, home for aged. $525,000. Plans deposit $50. Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, archts. CD 9/7/44—ENR 9/21/44.

Sask., Swift Current—E. H. Rice, Union Hospital, 4 story, concrete, brick hospital for Municipality, **$250,000.** H. K. Black, 3 Black Bldg., Regina, archt., CD 8/30/45—ENR 9/13/45.

March 28

Calif., Santa Clara—Alum Rock Union School Dist., Santa Clara, 1 story, frame, stucco and park brick veneer, 15 classroom school on Kirk Ave. between Alum Rock Ave. and McKee Rd., $400,000. Plans deposit $50. Kress & Gibson, 515 First Natl. Bank Bldg., archt.

Ky., Frankfort—State, Engrg. & Construction Div., Frankfort, dormitory at Kentucky State College, $300,000.

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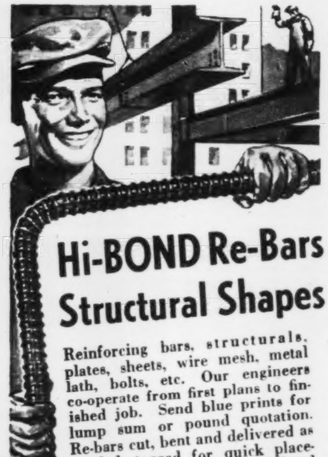

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Tex., Plains—Plains Rural High School Dist. 1, Plains, masonry high school and grammar school addn. $250,000. J. C. Berry & Kerr & Kerr, 312-B. W. 10 St., Amarillo, archts.

March 29

Calif., Fresno—Fresno Co., Courthouse, 2 story, 24,000 sq. ft. floor space nurses' home at Fresno County General Hospital, $360,000. Plans deposit $50. Fred L. Swartz & W. G. Hyberg, Rowell Bldg., archt. and F. W. Kellberg, 320 Market St., San Francisco, engr. CD 3/5—ENR 3/10. Extended date.

Ia., Traer—City, City Hall, light plant imprvs., $70,000. E. L. Patera, Royal Union Bldg., Des Moines, engr.

Okla., Lake Murray—State Resources Board, Capitol, Oklahoma City, lodge and 40 cabins. $850,000. Plans deposit $50. Harold E. Flood, Ardmore, archt. CD 12/13/48—ENR 12/23/48.

March 30

Fla., Miami Beach—City Council, C. W. Tomlinson, city clk., Miami Beach, auditorium. L. Murray Dixon, 605 Lincoln Rd., Henry Hohauser, 4011 Chase Ave. and Russell T. Pancoast & Assoc., 927 41 St., all Miami Beach, archts. Plans deposit $50.

N. Y., Flushing—Bd. Higher Educ., Administration Bldg. of Queens College, 65-30 Kissena Blvd., general constr., plumbing and drainage, heating, ventilating and air-conditioning, electrical; elevator and dumbwaiter; lighting fixtures and illuminated signs for various work in connection with Science Bldg. No. 1 for Queens College, Extended date. CD 2/17—ENR 3/3.

April 1

Utah, Roosevelt—Duchesne County School Bd., Roosevelt, constructing Union High School, Fetzer & Fetzer, Templeton Bldg., Salt Lake City, archts.

B. C., Victoria—Victoria School Bd., Victoria, 2 story, concrete, Topaz Ave. High School, $600,000. Birley, Wade & Stockdill, 605 Courtney St., archts. CD 2/28/47—ENR 3/20/47.

April 4

Idaho, Coeur d'Alene—North Idaho Junior College, Coeur d'Alene, 2 story, 61x176 ft. and 118x163 ft. brick, auditorium, classroom and gymnasium bldg., $495,000. G. M. Rasque & Son, Washington Trust Bldg., Spokane, Wash. CD 11/17—ENR 12/16, under Commercial Bldgs.

✦North Dakota—Bureau Reclamation, Dpt. Interior, Bismarck, furnishing and erecting 9 two bedroom and three 3 bedroom residences for Cannonball Govt. Camp, Spec. RS-BIS-12 (Missouri River Basin Proj. Region 6).

April 5

✦Colorado and Kansas—Bureau Reclamation, Dpt. Interior, Region 7, New Customhouse, Denver, Colo., constr. residence, combination garage and testing laboratory, pump house, water supply sys., gas supply sys., sewage disposal sys., driveway, parking area and sidewalks for Government Field Construction Facilities at Bonny Dam, St Francis Unit, Upper Republican Div., Spec. VII-55 (Region 7, Missouri River Basin Proj., L. N. McClellan, ch. engr.

✦D. C., Wash.—U. S. Eng., First and Douglas Sts. N. W., Wash., Zone 25, neuropsychiatric ward alterations, Army Medical Center, Walter Reed General Hospital, Serial No. 49-080-49-123 (28)M.

✦Alaska, Palmer—U. S. Dpt. of Agriculture, 14 St. and Independence Ave., S. W. Wash. 25, D. C., research laboratory at agriculture experiment station, U.S.D.A. No. 1944-49.

April 6

●N. Y., Binghamton—Bureau Contracts and Accounts, Albany, 780 bed Medical-Surgical bldg. at State Hospital. $2,500,000. CD 7/11/45—ENR 7/26/45.

April 7

✦Ohio—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Pa., damtenders dwellings and appurtenant work, Berlin Dam, Portage Co. Serial No. Eng-36-958-49-106.

April 8

Colo., Ft. Morgan—School Dist. No. 3, Ft. Morgan, Junior-Senior High School addn., $550,000. John K. Monroe, 40 Security Bldg., Denver, archt. CD 6/22—ENR 6/24.

Ont., Toronto—Housing Authority of Toronto, 465 Bay St., Regent Park Housing, incl. Unit 3, 3 story, bsmnt., 131x239 ft. H-shaped, brick bldg., and Unit 4, 100x100 ft. L-shaped, 8 family unit. Approx. $540,000. J. E. Hoore Jr., 481 Eglinton Ave. W., archt.

April 12

N. Y., New York—Supt. School Buildings, Design and Construction, 49 Flatbush Ave. extens. Brooklyn Zone 1, general constr. P. S. 33, 26 St. and 9 Ave. CD 1/29/43—ENR 2/4/43.

Tex., College Station — Agricultural & Mechanical College of Texas, College Station, 10,000 sq. ft. steel frame, concrete block cattle barn, Unit No. 1, $75,000. Carlton W. Adams, 228 Administration Bldg., College Station, A. & M. College System Archt. CD 10/6—ENR 10/28.

April 14

Wyo., Torrington—Goshen County Hospital, Torrington 1 story bsmnt., 145x234 ft. brick, concrete, glass block hospital. Over $250,000. Goodrich & Wilking, 266 E. 2nd St., Casper, engr. and archt. CD 4/29—ENR5/13.

BIDS ASKED

Wash., Longview—School Bd., Longview, Broadway school addn. $250,000. CD 4/9/46

LOW BIDDERS

●Ala., Birmingham—City, City Hall, Mar. 8, City Hall, from J. A. Jones Constr. Co., Walton Bldg., Atlanta, Ga., **$1,982,200** est. $2,500,000. CD 2/7—ENR 2/10.

Calif., Pasadena — Tournament of Roses Assoc., City Hall, Feb. 28, 9,000 seat rein.-con Rose Bowl Addn., from The Hermann Co., 417 S. Hill St., Los Angeles, **$316,672**, est $400,000. Hunt, Chambers & Ware, 124 W. 4 St., Los Angeles, archts. and engrs.

Calif., Santa Barbara—Santa Barbara High School Dist., 1235 Chapala St., Mar. 1, 2 story, bsmnt., 100x146 ft., rein.-con. gymnasium, from J. W. Baily Constr. Co., 214 Balboa Blvd., **$328,984**, est. $300,000. Seule & Murphy, 116 E. Sala St., archt. and Hillman & Nowell, 816 W. 5 St., Los Angeles, engr. CD 2/10—ENR 2/17.

●Calif., Visalia—Visalia Union High School Dist., Visalia, Mar. 1, steel frame, concrete walls high school from Ted Merrill, 911 E Redondo Blvd., Inglewood, **$1,478,000.** Est $2,500,000. H. L. Gogerty, 3123 W. 8 St., Los Angeles, archt. CD 2/14—ENR 10/30/47.

Idaho, Boise—School Bd., Boise, Mar. 7, 2 story rein.-con. junior high school addn., from J. O. Jordan & Sons, Boise, **$341,220.** Est. $300,000. CD 2/28.

Ill., Crystal Lake—Bd. Educ., Dist. 247 City Hall, Mar. 3, 2 story, 130x140 ft. brick, stone, concrete grade school from Peter Hamlin Constr. Co., 9 S. Clinton St., Chicago, Over **$500,000.** CD 2/23.

Ill., Mount Vernon—School Dist. No. 80, Mount Vernon, 1 story, L-shaped masonry, steel Field Grade School, masonry, steel Franklin Grade School from J. L. Simmons Co., Inc., 2146 N. Woodford St., Decatur, **$553,553.** McCoy & Wilson, 1108½ Main St. archts. CD 5/28/47—ENR 6/12/47.

●Ia., Iowa City—State Bd. Educ., Des Moines, Feb. 24, general contract library at University of Iowa, from Weitz Co., Inc., 406 Fleming Bldg., Des Moines, **$1,108,130.** physical plant shop, from Kucharo & Assoc., 225 Jewett Bldg. Des Moines **$105,890.** CD 2/9—ENR 2/17.

Minn., St. Peter—State Dpt. Admin., State Capitol, St. Paul, Feb. 28, boiler, power plant alterations and addns., State Hospital, from Commonwealth Electric Co., 417 Broadway, St. Paul, **$93,806;** piping from Pioneer Power Sales Inc., 1955 University Ave., St. Paul, **$88,819.** CD 2/9—ENR 2/17.

●N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York Zone 7, Mar. 8, foundations, appurtenances for Boulevard Houses, Proj. No. NYC-16 in area bounded by Linden Blvd., Ashford St., Wortman Ave., Hendrix St., Stanley and Schenck Aves. from Horn Constr. Co., 291 Broadway, New York Zone 7, **$1,083,828.** CD 2/7—ENR 2/17.

●N. Y., Poughkeepsie—Bureau Contracts & Accounts, Albany, Mar. 9, General Constr., 900 bed Medical and Surgical bldg. at Hudson River State Hospital from Merritt-Chapman & Scott Corp., 17 Battery Pl., New York, **$6,538,931*****heating from Whitney Dierks Heating Corp., Poughkeepsie, **$531,300*****sanitary work from Novak & Rehner, Inc., 623 10 Ave., New York, $519,214***electrical from Kaplan Electric Co., 128 E. 16 St., New York, **$388,974.** CD 2/4—ENR 2/10.

●N. Y., Schenectady — Municipal Housing Auth., 402 Millard St., Feb. 15, general contract, Housing Proj. NYS-34, East Van Vranken Ave., from John A. Johnson & Sons, Inc., 270, 41st St., Brooklyn, Zone 32, **$1,654,000.** CD 1/12—ENR 1/20.

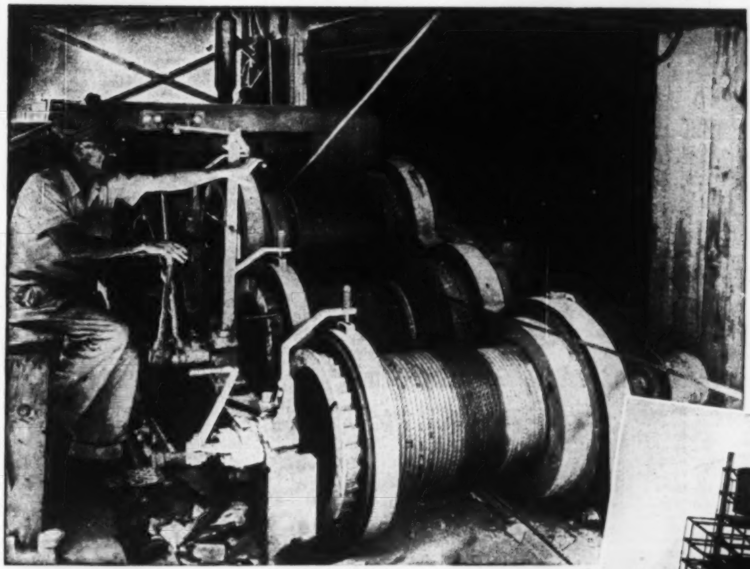
Okla., Durant—Bd. Affairs, Capitol, Oklahoma City, machine shop and home economics bldg. at Southwestern State College from Charles T. Hughes, 1808 Linwood St., Oklahoma City, **$165,628.** Est. $155,000. CD 12/12/47—ENR 12/25/47.

✦Oregon — Bonneville Power Admin., 729 N. E. Oregon St., Portland, project indefinitely postponed, constructing Walton substation, Inv. 4499, Lane Co. CD 2/24.

Pa., Phila.—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Mar. 9, general constr., boiler plant for female group at Philadelphia (Byberry) State Hospital from Wark & Co., 1700 Sansom St., **$488,770***** mechanical equip. and piping from Ambrose-Augusterfer Corp., 247 E. Ashmead St., Zone 44, **$310,000.** CD 2/14—ENR 2/24.

●Pa., Phila.—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Mar. 9, general constr. Building No. N-9, Maximum Security Bldg. for male patients at Phila. (Byberry) State Hospital from Wark & Co., 1700 Sansom St., **$1,497,770.** CD 2/1—ENR 2/10.

Va., Alexandria—Bd. Educ., Supt. of Schools, City Hall, Mar. 4, Charles Barrett School from Eugene Simpson & Brother, 2 W. Walnut St., **$406,996.** CD 2/21—ENR 2/24.



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CONTRACTS AWARDED

Calif., Alhambra—Alhambra City School Dist., 601 N. Garfield St., 6 frame and stucco bldgs. at William Northrop Elementary School, to V. O. Brunzell Co., 14715 LaSalle Ave., Gardena, **$388,411.** Clarence H. Rawlings, 100 S. 1 St., Alhambra, archts. CD 2/19—ENR 3/4.

●**Calif., Culver City**—Culver City School Dist., 3955 Van Buren Rd., Farragut Dr. Elementary School and Farragut Dr. Intermediate School, to Burnzell Constr. Co., 3945 Higuera St., Culver City, **$1,110,513,** est. $1,250,000. Bids 2/24, awarded 3/2. CD 2/10—ENR 2/17.

Conn., Stamford—City Housing Auth., 5 Putnam Ave., fifty-four 2 story, bsmnt., frame family unit garden apartments Dale St., to F. D Rich Co., Inc., 322 Main St., **$432,000.** CD 12/15—ENR 1/1.

Ill., Chicago — Chicago Transit Authority 175 W. Jackson St., brick bus terminal, 1339-53 W. 103 St., to Joseph J. Duffy Co., 176 W Adams St., **$856,324.** Battery & Childs, 231 S. LaSalle St., engrs. Bids 1/11. Awarded 3/3. CD 1/20—ENR 1/27.

●**Ill., DeKalb**—Illinois Dpt. P. Wks., Springfield, rein.-con. stone, brick womens dormitory, Northern Illinois State Teachers College to Federal Constr. Inc., 30 N. Dearborn St., Chicago, **$1,500,000.** C. Herrick Hammond state archt. CD 2/14/45—ENR 3/8/45.

Ill., Glen Ellyn—Bd. Educ., Glen Ellyn, 2 story, 80x120 ft. brick, concrete Main Elementary school addn., to Henry Pfutzenreuter & Sons, 53 W. Jackson St., Chicago, **$250,000** Bids 2/25. CD 2/8—ENR 2/10.

●†**Ind., Indianapolis**—Veterans Admin., Vermont Ave., between H and I Sts., N. W Wash., 25, D. C., hospital and quarters to Gust K. Newberg Const. Co., 125 and New York Sts., Whiting, Ind., **$7,684,000.** CD 2/7—ENR 2/17.

Neb., Red Cloud—City, City Hall, power plant imprvs., incl. building alterations, generating equip. to Fairbanks-Morse & Co., 9 and Harney Sts., Omaha, **$90,095.** Est. $126,-700. Bids 2/24. CD 2/10—ENR 2/17.

Tex., San Antonio—City Public Service Board, 201 N. St. Marys St., reconstructing Comal-Grandview Electric Power sub-station force-account. Approx. **$200,000.** CD 7/31/47—ENR 8/21/47.

Utah, Midvale—Jordan School Dist., Sandy general contract Midvale grade school to Talboe & Harlin Co., P. O. Box 411, Provo **$419,712.** Bids 2/3. CD 2/16.

Alta., Lethbridge—Municipality, 42x70 ft concrete boiler house, to Bird Constr. Co. Ltd 14 Third Ave., Lethbridge. Est. **$90,000** Townley & Matheson, 1376 Hornsby St., Vancouver, archt.

B. C. Vancouver—Vancouver School Bd. 590 Hamilton St., John Oliver High School addn., to Smith Bros. & Wilson Ltd., [illegible] Richards St., **$965,735.** Bids 2/7. Awarded 3/5. CD 2/21—ENR 3/3.

Ont., Toronto—Scarborough Collegiate School Bd., Kingston Rds. and St. Clair Ave. E 2 story, bsmnt., 48x275 ft. brick, stone, steel concrete Scarborough Collegiate addn., to Bennett-Pratt, Ltd., 30 Bloor St. W. Approx **$350,000.** Carter & Coleman, 60 Front St. W archts.

Que., Drummondville—Municipality, 2 story, 85x214 ft. concrete, steel, brick garage and market to B. Robidas, 164 du Moulin, **$194,-350.** Est. $300,000. Bids 2/14, CD 3/2—ENR 3/10, under LB.

Que., Quebec City—Giffard School Comn., A. Grenier, chn., G. Gergardin, secy., girls school, Renouard and Guimored Aves., to Capitanel Constr. Co., 490 Notre Dame St Cap de la Madeleine. Approx. **$416,000.** E. R Talbot, 50 Vieux-Moulin, archt.

Que., St. Laurent (Postal Dist. Montreal)—Central Mortgage & Housing Corp., 1253 McGill College Ave., Montreal, and 70 Lyon St., Ottawa, Ont., 85 duplex houses, Monkland Blvd., to L. B. Magill Co. Ltd., 4720 Ridgeway St., Montreal, **$800,000.** J. J. O'Sullivan, 1253 McGill College Ave., Montreal, engr. Bids 2/17. CD 2/1—ENR 2/3.

COMMERCIAL BUILDINGS

BIDS ASKED

March 21

B. C. Vancouver—Mercer & Mercer archts 615 W. Hastings St., 2 story, 100x122 ft. steel rein.-con. bldg., for The Salvation Army. $250,000.

April 15

Ind., Anderson—Anderson Apartments, Inc., Pick Hotels Corp., 26 N. Wacker Dr., Chicago, Ill., 12 story, 60x72 ft. stone, brick, rein.-con stores, offices, and apartments, conversion from hotel $300,000. Plans deposit $25., Allen & Kelly, 435 Architects & Builders Bldg., Indianapolis, archts., Harry Greenwood, c/o owner, consult. engr. CD 11/11—ENR 12/16.

About May 1

Ia., Corning—Rosary Hospital, Corning, 3 story, 42x120 ft. concrete, brick hospital, $400,000. Wetherell & Harrison, Shops Bldg., Des Moines, archts. CD 2/18—ENR 2/21.

Fla., Tallahassee—State Bank, c/o Prentiss Huddleston & Assoc., archts., 212 N. Adams St., soon lets contract bank.

Ill., Chicago — St. Monica Parish, c/o Pirola & Erbach, archts., 221 N LaSalle St., 1 story, 125x160 ft. brick, concrete, stone, T-shaped school and church.

●**Tex., Dallas**—Herman Loupot, c/o Westmoreland Village, 203 N. Burnet St., shopping center, 10 acre tract in Oak Cliff, **$800,000;** commercial units, Fort Worth Hy. **$350,000.** Leinbach Bros., 600½ E. Jefferson St., archts., Koch & Fowler, Gr. Natl. Life Bldg., engrs. CD 3/3—ENR 3/17.

SOON LETS CONTRACT

Ill., Skokie—College Hill School, Forestview and Davis Sts., soon lets contract 1 story brick school addn., $350,000. Plans deposit $10, Alfred P. Allen, 225 N. Michigan St., Chicago, archt.

Minn., Minneapolis — Minnesota District, Luthern Missouri Synod, 402 Loring Medical Bldg., soon lets contract student center, 11 Ave. S.E. and University Ave. Extended date. CD 3/2—ENR 3/10.

Pa., Media — Roman Catholic Church of the Nativity, B.V.M. 30 E. Franklin St., soon lets contract school and auditorium. **$250,000.** G. C. Freeman, 419 Corsonia Ave., Pennside, Reading, archt.

Ala., Birmingham — First Nazarene Church c/o Van Keuren Davis & Co., American Life Bldg., soon lets contract 2 story church addns., alterations.

Ala., Birmingham — Vanderbilt Garden Apartments, Inc., c/o Pembleton & Mims, Title Guarantee Bldg., soon lets contract 118 apartments units. Over $300,000.

N. J., Trenton — Greenwood Village Corp., 350, 5 Ave., New York, N. Y., apartment development, Massachusetts Ave. $250,000. Isadore Naftali, 312 High St., Newark, archt.

Tenn., Memphis — F. W. Woolworth Co., c/o Hanker & Heyer, archts., Commerce Title Bldg., soon lets contract department store.

N. Y., New York — Missionary Sisters of the Sacred Heart, 227 E. 19th St., Columbus Hospital, soon lets contract alterations and addns. $400,000. Anthony J. DePace, 151 W. 46 St., Zone 19, archt. CD 10/15/47—ENR 10/23/47.

Pa., New Bloomfield — William H. Lee, archt., 16 S. Broad St., Phila., soon lets contract senior dormitory for Carson Long Institute, New Bloomfield, **$250,000.** CD 12/6/45—ENR 2/21/46.

Pa., Norristown — Bell Telephone Co. of Penna., 1401 Arch St., Phila., soon lets contract central exchange addn. $460,000. Zantzinger & Borie, 1531 Locust St., Phila., archts. Frank N. Kneas, 504 Woodland Terrace, Phila., engr. CD 2/21—ENR 3/10.

LOW BIDDERS

Calif., Hanford—L. H. Lipman, owner, c/o Sears, Roebuck & Co., lessee, 216 W. 17 St., 2 story, rein.-con. department store, from L. H. Hansen & Sons, 313 Palm Ave., Fresno, **$383,564.** CD 1/27—ENR 2/3.

N. Y., Elmira—Robert Turner Bickford, archt., 215 W. Water St., rejected bids Feb. 15, 2 and 3 story 60x158 ft. academic bldg.; 1 story 29x33 ft. boiler house, brick, stone for Elmira College, College Ave. CD 1/17—ENR 1/27.

S. C., Charleston — Grecian Society, c/o Augustus E. Constantine, archt., 139 Calhoun St., church from Skinner & Kuddock, Inc., 12 State St., **$288,865.** CD 2/7—ENR 2/17.

Tex., Dallas—Wynnewood Development Co., 2311 Salerno St., **Feb. 25,** masonry frame, brick 12 store shopping village, Bldg. 1, from Inwood Constr. Co., 5151 Northwest Hy., **$251,000.** CD 2/16—ENR 2/24.

CONTRACTS AWARDED

Ala., Montgomery — Gulf Area Constr. Co., Caroline St., Montgomery, apartment house, Owner builds, **$250,000.**

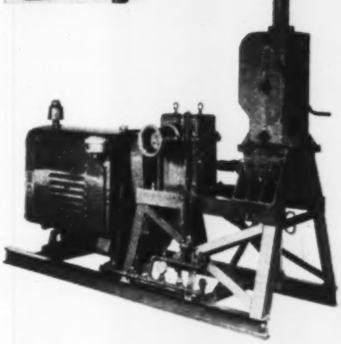
Calif., Los Angeles — Roman Catholic Archbishop, 714 W Olympic Blvd., 2 story, bsmnt., 60x163 ft., brick rein.-con. Our Lady of Loretto High School, to J. A. McNeil Co., Inc., 714 W. Olympic Blvd., Los Angeles, **$850,000.** George Adams, 2439 Hyperion Ave., archt. CD 2/2—ENR 2/17.

Calif., Los Angeles—Bultry Corp., 9700 W. Pico Blvd., 90 frame, stucco dwellings to Allied Contractors, 9700 Pico Blvd., Los Angeles, Est. **$482,000.**

●**Calif., Los Angeles**—Mutual Housing Assoc., 626 N. Robertson Blvd., 197 dwellings in Keuter Canyon, to Shumaker-Evans Constr. Co., 6631 E. 26 St., Los Angeles and Womak Constr. Co., 1712 S. Central Ave., Phoenix, Ariz., **$2,100,000,** est. $2,000,000. Bids 3/2. CD 2/15—ENR 2/17.

Conn., Manchester — Alexander Jarvis Co., 6 Dover St., fifty 1½ story 6 room, frame dwelling units, Olsott St. Exten., Owner builds, **$450,000.**

Conn., New Haven — Connecticut State Medical Society, 258 Church St., 3 story, brick, steel, concrete Medical Administration Bldg., St. Ronan and Edwards Sts., to E. & F. Constr. Co., 94 Wells St., Bridgeport. Est. **$250,000.** CD 12/14. CD 2/16—ENR 2/24.



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Del., Wilmington—John V. Ryan, Jr., Mayview Manor, New Castle residential development Mayview Manor, separate contract **$300,000.**

Del., Wilmington—Schnitzer-Harad Constr Co., Marshallton, residential development Pine St., separate contracts, **$250,000.**

Fla., Miami—R. & M. Corp., c/o Walter Robinson Shiner, archt., office. Owner builds Over **$300,000.** CD 2/18—ENR 3/10.

Fla., North Miami—Lamor Co., c/o contractor, several residential developments, to De Meo Constr. Co., 11731 N. W. 2 Ave Miami, Est. over **$250,000.**

●**Ill., Chicago**—F. W. Woolworth Co., 211 S State St., 100x145 ft. store and alterations to Henry Ericsson Co., 228 N. LaSalle St. Est. **$1,650,000** and **$350,000.** Shaw Metz & Dolio, 208 S. LaSalle St., archt.

Ind., Terre Haute—Ohio Oil Co., A. L. Henderson, dist. mgr., Marshall, Ill., 2½ story 48x120 ft. and 47x59 ft. wing, office to Wm. P Jungclaus Co., 825 Massachusetts Ave., Indianapolis, **$300,000.** CD 2/21—ENR 3/10.

Ky., Lexington—College of the Bible, 441 W. 2 St., Bosworth Memorial library, administration and classroom bldg., chapel, to R. D Short Co., 736 W. Main St., Lexington, **$482,321.** Bids 2/28. Awarded 3/8. CD 2/17—ENR 2/24.

La., Bossier City—F. O. Gilbert, Bossier City, 65 homes. Owner builds. Over **$250,000**

Md., Baltimore—Ralph W. Simmers, 2030 E. Belvedere Ave., fourteen 1 and 2 story brick residences, 5705-31 Willowton Ave.; one 1 story, brick, residence, 2015 Ramblewood Rd.; seven 2 story, brick residences, 1914-27 Crestview Rd.; five 2 story, brick, residences 1922-30 E. Belvedere Ave.; twelve 2 story brick residences, 5702-24 Willowton Ave separate contracts. **$359,000.** CD 1/26—ENR 2/17.

●**Minn., St. Paul**—St. Paul Fire & Marine Insurance Co., 111 W. 5 St., general contract, story, 110x146 ft. rein.-con. brick, steel office 126-134 W. 6 St., to W. Baumeister Constr. Co 635 Hamm Bldg., **$1,200,000.** CD 4/13—ENR 4/29.

Neb., Omaha—Slosburg Realty Co., 876 Brandeis Theatre Bldg., apartment, 48 and Chicago Sts., Owner builds. **$250,000.** O T Bowles, 4532 Hickory St., archt.

N. J., Clayton — Frank Stinici, Box 311 Clayton, residential development, separate contracts. **$700,000.** Dante D'Anastasio, 2010 Horner Ave., Pennsauken, archt.

●**N. J., Collingswood** — Sylvester A. Lowery 1716 W. Cheltenham Ave., Phila., Pa., apartment development, Collings Rd. and White Horse pike to E. J. Frankel, 1325 Walnut St., Phila., Pa., **$10,000,000.** CD 2/18—ENR 2/24

N. J., Paulsboro—Tri-State Homes Inc., Municipal Airport, Millville, residential development, Lincoln Ave. etc., separate contracts. **$250,000.**

N. J., Pennsauken—Englewood Homes Inc. 506 Dwight Ave., West Collingswood, residential development, separate contracts. **$250,000.** Arthur B. Gill, 111 N. 4 St., Camden, archt

N. J., Pitman—Frank Stinici, Box 311, Clayton, residential development, separate contracts. **$250,000.** Dante D'Anastasio, 2010 Horner Ave., Pennsauken, archt.

N. J., Woodbury—Harry Spiegel, 1512 Walnut St., Phila., Pa., residential development Barber Ave., separate contracts. **$250,000.** Dante D'Anastasio, 201 Horner Ave., Pennsauken, archt.

N. J., Woodbury—Dr. Henry Spiegel, 40 S. American St., residential development, E Barber or Hemlock Terrace and Griscom Dr to Tait & Tait, 104 Oak Ave., Westville. **$250,000.** Dante D'Anastasio, 2010 Horner Ave., Pennsauken, archt.

Pa., Ambler—William F. Roth, Jr., 110 Terminal Ave., Erdenheim, residential development, Tennis Ave., etc., separate contracts **$250,000.**

Pa., Canonsburg—Hutchinson Hall, Inc., 40 Murdock St., three 39 x 133 ft. brick veneer apartments, steel or wood joist floor and roof constr. to Hardy & Rankin, 40 Murdock St., Est. **$250,000.** Phillip Friedman, 121 S. Negley Ave., Pittsburgh, archt.

Pa., Darby—Penn Fruit Co., 1919 Chestnut St., Phila., super market to United Bldg Constr. Co., 845 N. 19 St., Phila., **$350,000.** David Supowitz, 246 S. 15 St., Phila., archt

Pa., Downingtown—Leon Gabel, 273 Highland Ave., residential development, Highland Ave. etc., separate contracts. **$250,000.**

●**Pa., Grove City**—Grove City College, Grove City, two, 4 story, bsmnt, 40 x 200 ft. brick dormitories, concrete floor, steel joist floor and roof constr. to Montgomery Constr. Co., 801 W. Main St. Est. **$1,200,000.** Bids 2/1. CD 1/25—ENR 1/27.

Pa., Lansdale—St. Stanislaus R. C. Church E. Main St., high school, separate contracts **$250,000.**

Pa., Phila.—Cutler Constr. Co., 1615 Chelten Ave., residential development, Fanshawe St. separate contracts. **$550,000.**

Pa., Phila.—Carl Metz, 8014 Ogontz Ave. residential developments, Eastwood and Englewood Sts., **$450,000;** Forrest Ave. **$404,000.** separate contracts.

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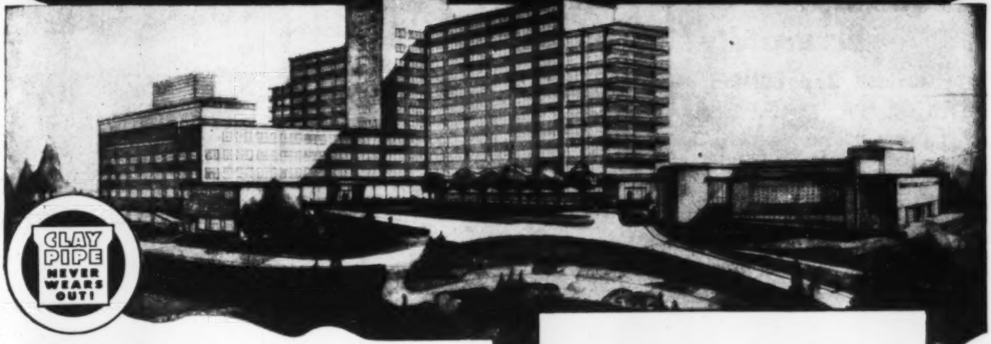

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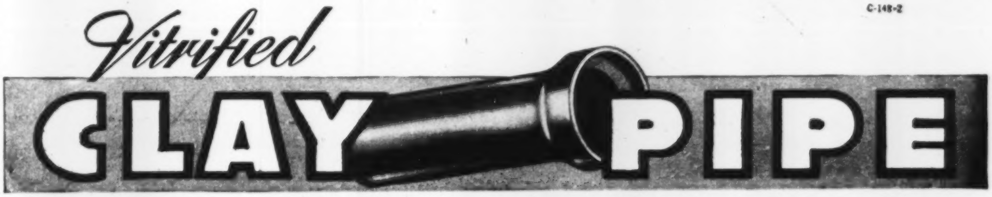

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Pa., West Chester—New Type Homes, Inc., 234 W. Market St.,residential development, Marshall Square Manor, separate contracts. **$500,000.** Corcoran & Mills, 234 W. Market St., archts.

Tenn., Clarksville — Jack Miller & John Moss, Clarksville, 75 homes. Owner builds. **$500,000.**

Tex., Dallas — Crown Constr. Co., 1911 S. Westmoreland St., 38 dwellings. Owner builds. **$250,000.** CD 3/3.

Tex., Garland— H. & N. Builders, Garland, 80 dwellings to Harris & Boyd, Garland. **$480,000.** CD 3/3, under CA.

●**Tex., Houston**—Deepwater Homes Development Co. Inc., c/o Maurice Krull, 2005 Canal St., 150 dwellings. **$1,250,000;** community center, **$450,000.** Owner builds. CD 11/1—ENR 11/18.

Tex., Houston — Shore & Brown, 322 W. Cowan St., community center. Own forces. **$275,000.** CD 10/22/47—ENR 11/13/47.

Tex., Houston — Highland Village Corp., 3713 Inwood St., 100 dwellings. Own forces. **$850,000.** CD 12/15/47.

●**Tex., Houston**—Southway Manor Corp., 4110 Dennis St., 62 two story apartments. Owner builds. Approx. **$1,500,000.** CD 3/7.

Tex., Houston—H. Sterling, 3965 Del Monte Dr., 60 brick veneer apartment units. Revere St. Own forces. **$275,000.** CD 11/22—ENR 12/16.

Tex., Houston—R. A. Carlson, 6900 Old Main St. Rd., residential project, Dumbarton St. Owner builds. Approx. **$325,000.** CD 3/4.

Tex., Victoria — Sisters of the Incarnate Word, Victoria, 1 story 58x260 ft. school and 58x87 ft. wing, masonry constr. to Urban Constr. Co., Victoria, **$450,000.** H. Steinbomer, 912 Travis Bldg., San Antonio, archt., Frank T. Drought, 117 W. Pecan St., San Antonio, engr.

Wis., Green Bay—Wisconsin Telephone Co., 722 N. Broadway, Milwaukee Zone 2, 2 story, bsmnt., 102x133 ft. rein.-con. brick central office to The Selmer Co., Green Bay. Bids 2/21. CD 2/16—ENR 2/24.

Ont., Toronto — Model Builders Inc., 348 Whitmore Ave., housing project, Steiner Ave., Owner builds, **$250,000.**

Que., Magog—Roman Catholic Parish of Ste. Margaret-Mary, St. David St., 83 x 166 ft. church, to Raoul Cabana, Magog, Est. **$300,000.** J. A. & A. Poulin, 63 Prospect St., Sherbrooke, archts., Brouillet & Carmel, 3605 St. Denis St., Montreal, engrs. CD 2/18—ENR 2/24.

Que., Verdun—P. Senecal, 206 St. Peter St., 50 dwellings, Owner builds, **$200,000.**

INDUSTRIAL BUILDINGS

BIDS ASKED

March 21

Mo., St. Louis—WAREHOUSE—Minneapolis-Honeywell Regulator Co., 4030 Chouteau Ave., Zone 10, 1 story, 69x96 ft. brick, concrete, warehouse, office, 4354 Olive St., Wm. B. Ittner, Inc., 408 Bd. Educ., Bldg., 911 Locust St., Zone 1, archt. CD 2/28—ENR 3/10.

March 24

La., New Orleans — PLANT — American Radiator & Standard Sanitary Corp., c/o Prack & Prack, archt., Federal & Philadelphia Sts., Pittsburgh, Pa., material handling plant.

March 25

Tex., San Antonio — ADMINISTRATION — San Antonio Transit Co., Transit Tower Bldg., administration bldg. $400,000. Atlee B. & Robert M. Ayres, Transit Tower Bldg., archt., Frank T. Drought, 117 W. Pecan St., engr. Bids 7/1 rejected. LB $437,434. CD 7/8—ENR 7/15.

About March 29

Ky., Jackson—PLANT—Royal Crown Bottling Co., Jackson, plant. **$90,000.**

March 31

Minn., Jackson—DIESEL ENGINES—Federated Rural Electric Assn., G. Comstock, pres., furnish and install 3 diesel-fuel (natural gas and oil) diesel engines, each direct connected to 1000-1200 KW A. C. generator appurtenances and auxiliaries. $150,000. Plans deposit $25. Pfeifer & Shultz, 702 Wesley Temple Bldg., engr. CD 1/14.

S. C., Pageland — WAREHOUSE, etc. — Lynches River Electric Co-operative, Pageland, warehouse and office. Plans deposit $25. Southern Eng. Co., 699 Spring St. N. W., Atlanta, Ga., archt.

April 1

Ky., Millstone—COAL TIPPLE—South East Coal Co., Millstone, coal tipple. Over $100,000.

April 2

Ky. Cornettsville — COAL TIPPLE and CHUTE—Miniard Coal Co., c/o Allison Miniard, coal tipple and chute, $100,000.

April 8

S. C., Conway—WAREHOUSE—Horry Electric Co-operative, Inc., Conway, warehouse and office. Plans deposit $25. Southern Engr. Co., 699 Spring St., N. W. Atlanta, Ga., archt.

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About April 8

Ky., Jackhorn — PLANT — Elk Horn Coal Corp., Jackhorn, coal cleaning plant. Over $75,000.

About August 1

Kan., Hays—GRAIN ELEVATOR—Farm Co-operative Assn., Hays, grain elevator. $150,000. CD 1/6—ENR 1/20.

April 11

Ga., Americus—WAREHOUSE, etc.—Sumter Electric Membership Corp., warehouse and office. Plans deposit $25. Southern Eng. Co., 699 Spring St. N. W., Atlanta, archts.

Bids Asked

Pa., Phila.—SALES, SERVICE—Kaplan & Fish., archt., 2120 Spruce St., sales and service bldgs. alterations for Wilkie Buick Inc., 1724 N. Broad St. $75,000.

R. I., Providence — FACTORY — Friendship Realty Co., c/o DiMitri & DiMitri, archts., 17 Exchange St., 3 story, brick, steel factory, Friendship St. $100,000. CD 2/23—ENR 3/10.

Ont., St. Catherines—PUMPHOUSE—J. B. Wallace, archt. c/o Supertest Petroleum Corp., 660 Richmond St., London, pumphouse and tanks, $75,000.

SOON LETS CONTRACT

Calif., San Bernardino—BAKERY ADDN.—Barbar Ann Baking Co., Massachusetts Ave., soon lets contract, 1 and part 2 story bakery addn., $200,000. Bennett & Bennett, 1165 E. Colorado St., Pasadena, archts. CD 2/28—ENR 3/10.

Ind., Anderson—FACTORY—Nicholson File Co., Jno H. Burton, mgr., 32 St., 1 story 52x164 ft. brick, steel, rein.-con. factory addn., $85,000. Ernest R. Watkins, Citizens Bank Bldg., archt.

N. J., Bridgeton—GARAGE, etc.—Cowell, Robinson & Martin, archts., 25 W. 43 St., New York, N. Y., soon lets contract 1 story bsmnt., 61x264 ft., brick agency bldg., garage and repair shop for General Baking Co., 420 Lexington Ave., New York, N. Y. $75,000.

Pa., Phila. — WAREHOUSE — I. Demchick, archt., 246 S. 15 St., soon lets contract warehouse addns. for Stern & Co., 340 N. 6 St. Over $68,000.

Pa., Chester — BUILDING — Scott Paper Co., foot of Market St., Chester, soon lets contract bldg. No. 71, alterations. Over **$68,000.** Des Granges & Steffian, 161 Devonshire St., Boston, Mass., archts.

LOW BIDDERS

Colo., Denver—WAREHOUSE—Union Pacific Railroad Co., W. C. Perkins, ch. engr., 1416 Dodge St., Omaha 2,. Nebr., warehouse, from Folson Constr. Co., 40 West Louisiana St., **$160,713,** est Over $68,000. Roland L. Linder, 507 Insurance Bldg., archt. and engr.

Del., Wilmington — WAREHOUSE — Delaware Floor Products Co., Christiana Ave., rejected bids warehouse, est. Over **$70,000.** Project postponed. CD 12/28—ENR 1/6.

Tenn., Nashville—BUS TERMINAL—Nashville Depot Corp., c/o Greer, Holmquist & Chambers, archts., Chamber of Commerce Bldg., Birmingham, Ala., bus terminal from Boone Contrg. Co., 3rd Natl. Bank Bldg., **$73,927.** CD 2/21—ENR 3/3.

Tex., Belton — POWER PLANT — Brazos River Transmission Electric Co-operative, Inc., Belton, addnl. power plant installations and imprvts. from E. E. Farrow, 6901 Forrest Park Rd., Dallas, **$99,980.** Laramore & Douglass, Inc., 79 E. Adams St., Chicago, Ill., engrs. CD 1/16/47—ENR 1/30/47.

Tex., Houston—WAREHOUSF—Southwestern Theater Equip. Co., 1416 Main St., 2 story 50x100 ft. frame, brick warehouse, rein.-con. slab fdn. from Lewis Duncan, 1417 Chenevert St., **$92,950.** Est. $75,000. CD 3/1—ENR 3/10.

CONTRACTS AWARDED

Ala., Moundville—SALES and SERVICE—Moundville Motor Co., c/o Wilmot C. Douglas, 226 N. 14 St., Birmingham, auto sales and service bldg., to Southeastern Mfg. Corp., Tuscaloosa. Est. over **$75,000.** CD 10/11—ENR 10/14.

Calif., Niles — FURNACE BLDG. — Pacific States Steel Corp., Niles, open hearth furnace bldg. Owner builds, **$175,000.** CD 1/5/47—ENR 1/30/47.

Calif., Oakland—FACTORY—J. C. and Margaret Lynn, foot of Park Ave., Emeryville, 1 story, steel factory, 1819 10 St., to N. H. Sjoberg & Son, 5604 E. 16 St. Est. **$70,000.**

Ga., Griffin—PLANT ADDN.—Thomas Packing Co., Frank Thomas, Griffin, packing plant addn. Owner builds, **$75,000.**

Ill., Chicago—BOILER HOUSE ADDN.—Peter Fox Brewing Co., 2606 W. Monroe St., boiler house addn., to Sumner S. Sollitt Co., 307 N. Michigan St., $75,500. Commercial Testing & Engrg. Co., 307 N. Michigan St., engr.

Ind., Evansville—BREWERY—F. W. Cook Brewing Co., 7 and Main Sts., 5 story, 50x100 ft. brick, rein.-con. steel, brewery addn., 7 St., to Ryan Constr. Co., Court Bldg., Est. **$400,000.** Harley, Ellington & Day, 153 Elizabeth St., Detroit, Zone 1, Mich., archts.

Ky., Clermont—BOTTLING HOUSE—Beam Distillery, Clermont, bottling house to Mac Constr. Co., Shelbyville, **$136,000.** Wagner & Potts, Fincastle Bldg., Louisville, archts., J. H. Potts, Fincastle Bldg., Louisville, engr.

La., Lake Charles—BUS TERMINAL—Southwest Greyhound Lines, c/o contractor, remodeling and extens. bus terminal, to Arch Munn & Sons, 5319 Junius St., Dallas, Tex., **$90,000.** Grayson Gill, 1913 San Jacinito St., Dallas, Tex., archt.

Md., Baltimore—STOCK and FERMENTING CELLARS—Gunther Brewing Co. Inc., 1211 S. Conkling St., 82x102x113 ft., brick, steel, concrete stock and fermenting cellars, to Morrow Bros., Inc., 2315 N. Charles St. Bids 2/23, awarded 2/28. CD 2/7—ENR 2/17.

●**Minn., Fox Lake** — PLANT — Interstate Power Co., 1000 Main St., Dubuque, Ia., electric generating plant, to Bates & Rogers Constr. Co., 111 W. Washington St., Chicago, Ill., Est. **$2,000,000.**

Mo., Florissant (St. Louis, Zone 21, P. O.)—WAREHOUSE — Delta Realty Co., Webster Groves, St. Louis, Zone 19, 2 story, 75x414 ft. sales room and warehouse, Hy. 66, north of Brown Rd., to Walter T. Hellmich, Inc., 1037 Big Bend Richmond Heights, St. Louis, Zone 7. Est. **$80,000.**

Mo., Kansas City—WAREHOUSE—American Sash & Door Co., 16 and Bellefontaine Sts., 21x136 ft., concrete brick warehouse, 1608-26 Walroad St., to William S. Rawlings, Co., 1004 Forrest Ave. Est. **$76,500.**

Mo., St. Louis—TERMINAL—Campbell 66 Express. Inc., F. G. Campbell, Springfield, 1 and 2 story, 55x174 ft. and 27x102 ft. T. shaped, brick, steel, concrete truck terminal, 805 S. 13 St., to Swan Constr. Co., 4504 Seibert Ave., Affton, St. Louis, Zone 23. Raymond X. Grueninger, 19 N. Meramec St., Clayton, St. St. Louis, Zone 5, archt.

N. J., Eagle Point (P. O. Westville)—OIL SEPARATOR BLDG.—The Texas Co., 134 E. 42 St., New York, N. Y., 160 x 227 ft. oil separator bldg., and drainage, concrete basin to H. John Homan, 434 Haddon Ave., Collingswood, Over **$125,000.** D. W. Carswell, c/o owner, ch. engr.

Okla., Tussy—PLANT—Magnolia Petroleum Co., Magnolia Bldg., Dallas, Tex., gasoline plant, handling 22 m. cu. ft. natural gas per day Stephens Co., to Jones & Laughlin Co., Thompson Bldg., Tulsa, **$600,000.** Awarded 2/16.

Pa., Lancaster — LABORATORY—Hamilton Watch Co., Columbia Ave. and West End Ave., 4 story bsmnt, and pent house, 61x181

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ft. and 61x81 ft. wing, engineering laboratory to D. S. Warfel, 440 N. Prince St. **$700,000.** CD 1/26—ENR 2/3.

Pa., Neville Island—(Pittsburgh P. O.)—MANUFACTURING BLDG.—Chaplin Fulton Mfg. Co., 38 Penn Ave., 1 story 150x220 ft. brick and block mfg. bldg., to Rose & Fisher, Republic Bldg., 200 E. Ohio St., Pittsburgh. Est. **$229,187.** Bids 2/15. CD 2/3—ENR 2/10.

Pa., Phila.—WAREHOUSE—Ayers Realty Co., 919 Walnut St., warehouse-showroom and offices alterations to Barclay-White & Co., 22 N. 36 St., **$70,000.** Pennell & Wiltberger, 1524 Chestnut St., engrs.

Pa., Phila.—SHOWROOM, PARTS DPT.—Giles & Ransome Inc., 2729 Hunting Park Ave., 1 and 2 story 15,000 sq. ft. brick, steel showroom and parts dpt. addn. to Lauter Constr. Co., 112 S. 16 St., **$80,000.** Carson & Carson, 16 S. Broad St., engrs.

Pa., Phila.—SERVICE BLDG.—Needham's Motor Service, Inc., 1429 Parrish St., motor service bldg. and office to Rex Constr. Co., 4347 Milnor St., **$70,000.** H. Childs Hodgens, 1420 Chestnut St., archt. CD 7/26/46—ENR 8/1/46.

Pa., Red Hill—MILL—Rayflex Mfg. Co., Red Hill, 1 story 82x115 ft. brick mill addn. to G. L. Janke, Lansdale. Over **$70,000.** Bids 1/31. CD 1/26—ENR 2/3.

S. C., Hemingway—WAREHOUSES—Tobacco Growers Warehouse Corp., c/o Parrott R. Hardy, supt. of constr., Mullins, 2 tobacco warehouses. Owner builds. Over **$125,000.** CD 2/4—ENR 2/17.

S. C., Mullins — WAREHOUSE — Paul V. Hardy, Mullins, 90,000 sq. ft. tobacco warehouse addn. Owner builds. Over **$100,000.**

S. C., Newberry — MILL — Kendall Mills, Newberry, mill addn. to McKoy-Helgerson Co., Greenville, Over **$100,000.**

Tex., Amarillo — WAREHOUSE — Phillips Petroleum Oil Co., Amarillo, warehouse, force account. **$75,000.** CD 7/26—ENR 8/5.

Tex., Beaumont—SUBSTATION, etc.—Bethlehem Steel Corp., c/o R. F. Hoffield, purch. agt. Island Park, Beaumont, 37x600 ft. steel piling, concrete deck, mooring pier and substation to Austin Bridge Co., 4720 Sycamore St., Houston. **$320,000.** Est. $300,000. Bids 1/26. CD 1/24—ENR 2/3.

Tex., Brownwood—WOOLEN MILL—Ziock Industries, Inc., Brownwood, woolen mill. Own forces. **$150,000.** CD 3/4.

Tex., Dallas—FACTORY—Southern Separator Co., 1300 Marilla St., factory, to F. S. Oldt Co., 403 S. Haskell St. Approx. **$70,000.**

Tex., Fort Worth—BUS TERMINAL—Southwest Greyhound Lines, Inc., c/o contractor, bus terminal and office to Arch Munn, 5319 Junius St., Dallas, Approx. **$400,000.** CD 10/28—ENR 11/11.

Tex., Houston — PLANT — Sanitary Farm Dairies, Inc., 1802 W. Gray St., diary and milk plant unit to Davis Constr. Co., c/o owners, **$70,000.** CD 10/5—ENR 10/7, under LB.

Tex., Laredo—PLANT—H. D. Whittenberg, McAllen, cotton gin plant, purchase and hire. **$75,000.**

Tex., San Antonio—LAUNDRY—Santa Rosa Hospital, W. Houston and Santa Rosa Sts., 2 story bsmnt., laundry plant and storage to Walsh & Burney, 928 N. Flores St. Approx. **$75,000.** Phelps & De Wees & Simmons, 1501 Majestic Bldg., archts., Frank T. Drought, 117 W. Pecan St., engr.

Tex., Stoneham—DAIRY, PLANT—W. N. Fabian, Stoneham, dairy and plant near Navasota. Own forces. Approx. **$75,000.**

●**Tex., Wichita Falls**—REFINERY PLANT—Panhandle Producing & Refining Co., Panhandle Bldg., refinery plant enlargement, own forces, under supervision of Universal Oil Products Co., 310 S. Michigan St., Chicago, Ill., and Jones & Laughlin Supply Co., Oil and Gas Bldg., Houston, engrs. Approx. **$1,000,000.** CD 12/22—ENR 12/30.

Tex., Wichita Falls—MILL—Wichita Falls Planing Mill, Wichita Falls, planing mill unit. Own forces. **$77,000.**

Wash., Seattle—PLANT—George A. Hormel & Co., 1229 6 Ave. S., 100x200 ft. mill addn. to meat packing plant to S. S. Mullen, Inc., 9 Ave. N. and Roy Sts. Est. **$100,000.** G. C. Field, Jones Bldg., archt.

W. Va., Charleston—BUS GARAGE—Atlantic Greyhound Lines, c/o contractor, bus garage, to A. G. Higginbotham Constr. Co., Charleston Natl. Bank Bldg. Over **$200,000.**

●**W. Va., Clarksburg**—WAREHOUSE—Hope Natural Gas Co., 445 Main St., West Clarksburg, 1 and 2 story 100x150 ft. brick, glazed tile warehouse, shop bldg.; ¾ mi. 56 ft. wide, steel frame bridge to Gilmore Carmichael, & Olson Co., 1873 E. 55 Stt., Cleveland, O. **$1,500,000.** CD 1/25—ENR 2/3.

Wis., Oconomowoc—PRINTING PLANT—C. W. Brown Printing Co., 136 N. Main St., 1 story 84 x 45 x 175 ft. steel brick, printing plant, concrete fdn. to Otto Biefeld, Watertown.

Alta., Calgary — WAREHOUSE—Consolidated Fruit Co. Ltd., 24 Michael Bldg., 120 x 190 ft. steel, brick, fruit and vegetable warehouse, 10 Ave. W., between Fourth and Fifth Sts., to Bird Constr. Co. Ltd., Seventh and Smith Sts., Regina, Sask., Approx. **$350,000.** Rule, Wynn & Rule, 513 Eighth Ave., archt.

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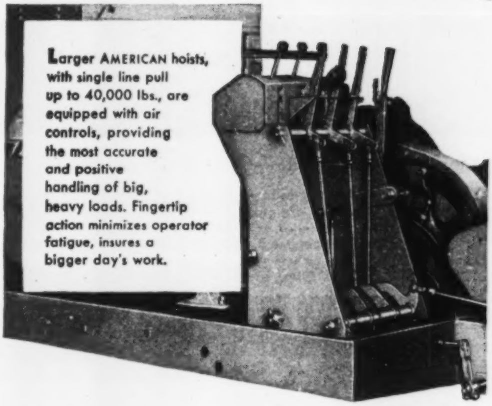

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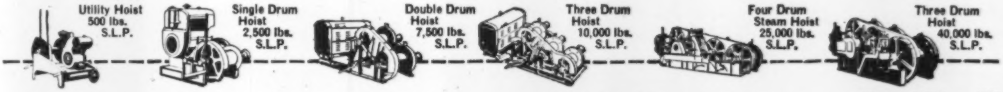
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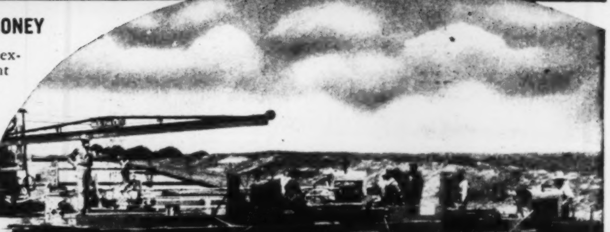

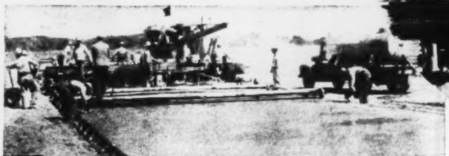

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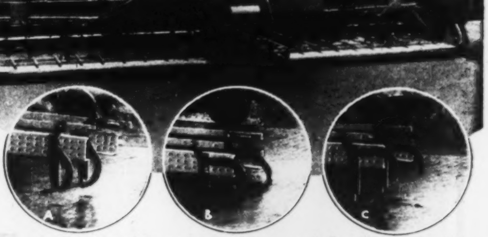

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B. C., Quatsino Sound—ICE PLANT—Kyuquot Trollers Co-operative Assn., 1140 Government St., Victoria, ice plant, Owner builds. **$75,000.** A. C. Smith, c/o owner, engr.

●B. C., Ruskin—British Columbia Electric Co. Ltd., Vancouver, electrical power plant addn., Owner builds, **$1,000,000.**

B. C., Sanca—MINE DEVELOPMENT—Lakeview Mines Ltd., c/o R. D. Powelson, Kimberley, mine development, incl. cookhouse, ore bins, blacksmith shop, warehouse. Owner builds. **$125,000.**

Ont., Geraldton—DIAMOND DRILLING—Coulee Lead & Zinc Mines Ltd., Geraldton, diamond drilling, to Boyles Bros., Kirkland Lake. Est. **$100,000.**

Ont., Port Arthur—TERMINAL—Saskatchewan Pool Elevators Ltd., Regina, Sack., pool terminal to Commonwealth Constr. Co., Ltd., 300 Royal Bank Bldg., Winnipeg, Man., **$150,000.** C. D. Howe Co. Ltd., Whalen Bldg., Port Arthur, engr.

Ont., Toronto — WAREHOUSE—Empire Brass Mfg. Co. Ltd., Dundas St. E., London, 3 story, bsmnt., brick, office and warehouse, Dartnell Ave. to Pigott Constr. Co. Ltd., 1250 Bay St. Approx. **$240,000.** Bids 2/21. CD 2/4—ENR 2/17.

Ont., Toronto — FACTORY — G. Tarlattini, 1108 Pape Ave., 2 story, bsmnt., concrete, brick factory, to A. F. Dini, 339 Shaw St., Approx. **$70,000.** Barnett & Rilder, 300 Benborough Dr., archts.

Ont., Windsor—PLANT—Canadian Sirocco Co. Ltd., 310 Ellis Ave., plant addn., to The Austin Co. Ltd., 16112 Euclid Ave., Cleveland, O., U. S. A., **$75,000.** CD 1/9/46—ENR 1/17/46.

●Que., Montreal East (Postal Dist. Montreal)—REFINERY Shell Oil Co. Ltd., 660 St. Catherine St., W., Montreal, refinery to A. G. McKee & Co., 2300 Chester St., Cleveland, O., U. S. A., and Fluor Corp. of Canada, Ltd., Montreal, Est. Over **$1,000,000.**

●Que., Montreal—PLANT—Dominion Textiles Co. Ltd., 710 Victoria Sq., St. Anns Mill addn., to Pentagon Constr. Co. Ltd., 1225 Bishop St., Approx. **$1,500,000.** Ernest Jubien, c/o owner, engr. CD 11/24.

Que., Montreal—FACTORY—Universal Ornament Mfg. Co. Ltd., 540 Beaudry St., 2 story, 67 x 143 ft. concrete, steel, brick, factory, Parthenais St., to Bereron & Potel Ltd., 4304 Marquette St., **$140,000.** CD 3/4—ENR 3/10, under LB.

Que., Shawinigan Falls—MINE DEVELOPMENT—Chavigny Gold Mines Ltd., P. O. Box 415, Montreal, iron and titanium property development. **$100,000.** Owner builds. L. Clerg, c/o owner, engr.

UNCLASSIFIED

BIDS ASKED

March 23

South Dakota — RURAL DISTRIBUTION LINES—Rosebud Electric Assn., Winner, 241 mi. rural distr. lines, Tripp Co. $200,000. Plans deposit $25. United Engr. Service, 600 Kasota Bldg., Minneapolis, Minn., engr. CD 3/8—ENR 3/10.

British Columbia—WHARF—J. M. Somerville, secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf repairs, Glen Valley, Gordon Rd., Hammond, McMillan Island, Port Kills, Port Mann and Whonnock. Approx. $95,000. Plans deposit $10. R. Blais, c/o owner, engr.

March 24

†Me., Augusta—CHAIN LINK FENCE—U. S. Eng., Bldg., 7, Camp Keyes, Augusta, installation of chain link fence, Camp Keyes, Serial No. MNG 17-018-49-02, extended date, CD 2/25—ENR 3/10.

Tennessee — RURAL DISTRIBUTION LINES—Fort Loudon Electric Co-operative, Madisonville, 170 mi. rural distr. lines and other sys. imprvs., Loudon Co. A. D. McWhorter, Jr., 212½ Union Ave., Nashville, engr. CD 12/25—ENR 1/20.

†Wyoming and Nebraska — OVERHEAD GROUND WIRES—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., installing overhead ground wires on Cheyenne-Gering 115 kv transmission line, Spec. 2584, Kendrick Proj. between Cheyenne, Wyo., and Gering, Neb. CD 2/25—ENR 3/10.

March 25

N. Y., Brooklyn—DUCT LINE—Bd. Transportation, 250 Hudson St., New York, Zone 13, constructing New York City Transit System Duct Line connecting the Central Office Bldg. at Jay St. and the IND, IRT and BMT Divisions subsurface railroads in Brooklyn.

March 28

Calif., San Jose — GRANDSTAND — Santa Clara Fair Assn., c/o Santa Clara Co. Bd. Supervs., Courthouse, rein.-con. steel 83x400 ft., grandstand with concrete asphalt flooring horse barn and locker rooms at Fairgrounds, $500,000. Plans deposit $25. C. J. Ryland, 467 Alvarado St., Monterey, archt. CD 6/1—ENR 6/3.

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March 30

British Columbia—DIKE—J. M. Somerville, secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., renewal Sapperton Dike, 1, Fraser River, Queens Reach, New Westminister, Approx. $75,000. R. Blais, c/o owner, engr.

March 31

Calif., Los Angeles — SWIMMING POOL — City Dpt. Parks & Recreation City Hall, swimming pool, bath house, clubhouse, at Cheviot Hill Playground, $250,000. Dwight Gibbs, 257 S. Spring St., Los Angeles, archt. Extended date. CD 2/24—ENR 3/3.

About April 1

Ala., Sheffield—SWIMMING POOL, etc.—City, Sheffield swimming pool and bath house. Vernon P. Crockett, P. O. Box 797 engr.

April 1

†California—TRANSMISSION LINES — Bureau Reclamation, Dpt. Interior, Elverta, 230 kilovolt transmission lines, tap line, from Shasta-Tracy Line 1 to P. G. & E. Company Shasta substation and wood-pole section of Shasta-Tracy line 1, near Redding, Central Valley Proj., Spec. 2587. L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr.

April 4

N. S., Halifax—PIER—C. P. Buckley, secy., c/o National Harbor Bd., West Block, Ottawa, Ont., reconstruction Pier 3, Halifax Harbor. Approx. $800,000. Plans deposit $100.

April 5

Calif., Petaluma—LIVESTOCK BLDGS.—State div. Architecture P. Wks. Bldg., Sacramento, 2 sheep and swine bldgs, cattle barn, poultry bldg., judging ring for 34th District Agricultural Assn. Plans deposit $25. Anson Boys, state archt.

About April 8

†N. M., Los Alamos—GAS PIPELINE—U. S. Atomic Energy Comn., Los Alamos, approx. 95 mi. 12 in. gas line extending from Los Alamos, N. M., in northwesterly direction to stated tie-in location on an existing gas line, about 50 mi. west of Cuba, N. M. and approx. 35 mi. south of Bloomfield, N. M. Inv. No. 291-49-122. Plans deposit $50.

April 12

Mont., Billings — GRANDSTAND—Yellowstone Co., Billings, replacing grandstand, Cushing & Terrell, 212½ N. Broadway, Billings, and Orr Pickering & Assoc., Fratt Bldg., Billings, archts. CD 1/26—ENR 2/17.

LOW BIDDERS

†Ark., Hot Springs—COOLING SYSTEM, etc. —National Park Service Dpt. Interior, Region 3, Santa Fe, N. M., cooling and distr. sys., incl. 100,000 gal. rein.-con. reservoir, 12 in. c.i. pipeline, pump house, appurtenances, etc., at Hot Springs National Park, from William Peterson, Commercial National Bank Bldg., Little Rock, **$158,475.** CD 1/46—ENR 2/3.

Calif., Los Angeles — PARK BLDG. — Bd. Supervs. Los Angeles Co., 501 Hall of Records, Mar. 1, 83x152 ft. community bldg. and auditorium in West Hollywood County Park, from Contracting Engineers, Inc., 2310½ W. Vernon Ave., **$150,750.** CD 2/10—ENR 2/17.

Calif., Los Angeles—TRANSIT SHED FACILITIES—City Harbor Comn., 102 City Hall, Mar. 2, transit shed facilities at Berts 154 and 155 from Baruch Corp., 5655 Wilshire Blvd., Los Angeles, **$942,150,** est. $750,000. CD 2/15—ENR 2/24, under L. B.

Calif., Susanville—GRANDSTAND—Lassen Co., Courthouse, Feb. 28, 2,400 seating, steel, cement floor grandstand at Lassen County Fairgrounds, from B and B Steel Electors, 532 39 St., Alameda, **$63,121.** CD 2/15—ENR 2/17.

Minn., Fairbault—STEAM TUNNEL—State, Dpt. Administration, State Capitol, St. Paul, Feb. 28, general contract steam tunnel for State School for Blind, from Peterson Constr. Co., 616 National Bldg., Minneapolis, **$57,300.**

N. D., Grand Forks — GENERATING EQUIPMENT — Minnkota Power Co-operative, Grand Forks, Feb. 24, generator for power plant from DeLaval Steam Turbine Co., 853 Nottingham Way, Trenton, N. J., **$336,600** ***condenser from Northwestern Power Equip. Co., 2295 University Ave., St. Paul, Minn., **$58,666.** CD 2/16—ENR 2/24.

†Wyoming—CIRCUIT BREAKERS—Bureau Reclamation, Dpt. Interior, Bldg 1-A, Denver Federal Center, Denver, Colo., Mar. 1, Schedule 1, three 115,000 volt circuit breakers for Boysen Switchyard, Spec. 2527, Missouri River Basin Proj. from Pacific Electric Mfg. Corp., 5818, 3rd St., San Francisco, Calif., **$52,220.**

†Wyoming—TRANSFORMERS, etc.—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., Mar. 1, Schedule 1, Item 1, one 10,000 kva auto transformer with three 69,000 volt lightning arresters; Schedule 1, Item 2, one 10,000 kva transformer with three 34,500 volt lighting arresters Spec. 2526, Missouri River Basin Proj. from Westinghouse Electric Corp., Gas & Electric Bldg., Denver, Colo., **$44,632** and **$53,168** respectively***Schedule 3, three 115,000 volt circuit breakers, Schedule 4, three 69,000 volt and five 34,500 volt circuit breakers, for Thermopolis substations from Pacific Electric Mfg. Corp., 5818, 3rd St., San Francisco, Calif., **$52,220** and **$60,900** respectively. CD 2/23.

CONTRACTS AWARDED

Ala., Athens—TRANSMISSION LINE—City, Athens, 25 mi. electric transmission line and conversion of 19 mi. line, to Victory Electric Co., 266 St. Michael St., Mobile, Ala., **$50,700.** Ladd Engrg. Co., 209 Wood Bldg., Ft. Payne, engrs.

●Ala., Montgomery—LIVESTOCK COLISEUM —State Bldg. Comn., 702 Washington St., livestock coliseum for State Agricultural Dpt., to J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C., **$1,560,000.** Bids 2/18. CD 2/23—ENR 3/3, under LB.

Arkansas—RURAL DISTRIBUTION LINES —First Electric Co-operative, Corp., Jacksonville, 123 mi. rural distr. lines, Pulaski Co., to Southern Line Constr. Co., 62 Auction Ave., Memphis, Tenn., **$161,752.** Chanaberry Engrg. Co., Inc., 1510 Washington Bldg., Louisville, Ky., engr. CD 1/21—ENR 1/27.

Calif., San Francisco—TERMINAL SUBSTRUCTURE—Bd. State Harbor Comrs., Ferry Bldg., substructure, incl. concrete piles, etc. for Mission Rock Terminal at Pier 50, to Clinton Constr. Co., 923 Folsom St., San Francisco, **$152,900.** Bids 3/2.

Florida—RURAL DISTRIBUTION LINES—Withlacoochee Co-operative, Dade City, rural distr. lines imprv. and extens., for addnl. service to present and future customers, Pasco. Owner builds, **$290,000.** CD 12/1/47—ENR 12/11/47.

Mo., St. Louis—STREET LIGHTING—City, Milton M. Kinsey, pres. Bd. P. Service, 304 City Hall, repair, maintenance street lighting sys., to R. J. McManemin, 3025 Brentwood Blvd., Brentwood, St. Louis, Zone 17, **$552,303.** CD 3/1—ENR 3/10, under LB.

B. C., Brentwood & Mill Bay—FERRY LANDINGS—Province of British Columbia, Parliament Bldg., Victoria, timber ferry landings, to Pacific Pile Driving Co. Ltd., 706 Fort St., Victoria. Approx. **$71,566.**

Georgia—POWER LINES—Rayle Electric Membership Corp., Washington, 303.89 mi. rural power lines in Greene, Hancock, Lincoln, Oglethorpe, Taliaferro and Wilkes Counties to Stuart Irby, 815 S. State St., Jackson, Miss., **$322,614.** Bids 3/8. CD 2/25—ENR 3/3.

Georgia—RURAL DISTRIBUTION LINE—Stailla Rural Electric Membership Corp., Alma, 400 mi. rural distr. lines, Bacon Co., to Alrich Electric Constr. Co., 630 11 St., Augusta, **$463,399.** Marcus C. Long, Alma, engr. CD 10/14—ENR 10/28.

Illinois — RURAL DISTRIBUTION LINE — Spoon River Electric Co-operative, Inc., Canton, 108.2 mi. rural distr. lines, Fulton Co., to Miller Constr. Co., Linton, Ind., **$156,926.** Stanley Engr. Co., Muscatine, Ia., engrs.

Ill., Belleville — DRIVE-IN THEATER — Bloomer Amusement Co., c/o Ritz Theatre, 403 E. Main St., 750 car capacity drive-in motion picture theatre on 34 acre tract on South 56 (State Route 161) west of Main St. incl. 75 ft. screen tower, screen 46x60 ft., projection booth, concession stands, walks, drives, ramps, in-a-car speakers, and recreation center for children, own forces. Over **$200,000.** George M. Peterson, Cleveland, O. engr. CD 8/18—ENR 9/2.

Ill., Gordons Junction (Robinson, P. O.)—DRIVE-IN-THEATRE — Sky View Amusement Co., Harry Jones, pres., Lawrenceville, drive-in theatre, 10 acre site, H. L. Musgrave property, 3 mi. east of Robinson. Owner builds. Approx. **$100,000.**

Ill., Wood River — GRANDSTAND and LOCKER—School Dist., 144 Madison Co., F. G. Dykeman, secy., East Alton, Wood River Community High School, general contract grandstand and locker, East Alton-Wood River Community High School to R. & R. Constr. Co., 735 Park Dr., Alton, **$51,606.** Est. $70,000. S. T. Pabst & Assoc., Goldman Bldg., East St. Louis, archts., CD 5/17/46—ENR 5/23/46.

Iowa — RURAL DISTRIBUTION LINE — Southern Iowa Electric Co-operative, Bloomfield, 85.2 mi. rural distr. lines, Davis Co., to Stewart, Inc., Anamosa, **$114,647.** Stanley Engr. Co., Muscatine, engrs.

Kansas—RURAL DISTRIBUTION LINES—Pioneer Co-operative Assn., Inc., Ulysses, 143 mi. rural distr. lines, Grant Co., to A. F. Reid, 702-4 National Bank Bldg., Topeka, labor, $34,763. materials, $143,000. **Total, $177,763.** CD 12/28.

Kansas—RURAL DISTRIBUTION LINES—Smoky Valley Electric Co-operative Assn., Inc., Lindborg, 75 mi. rural distr. lines, McPherson Co., to A. F. Reis, 702-4 National Bank Bldg., Topeka, labor, $23,379, materials, $75,000. Total, **$98,379.** Richardson Electric Engrg. Co., P. O. Box 263, Solomon, engr.

Kansas—RURAL DISTRIBUTION LINES—Sugar Valley Electric Co-operative Assn., Inc., Mound City, 171.21 mi. rural distr. lines Linn Co., to James H. Drew Corp., 528 Architects & Builders Bldg., Indianapolis, Ind., labor $62,448, materials, $171,000. Total, **$233,448.** CD 12/7.

Kentucky—RURAL DISTRIBUTION LINES —Henderson Union Rural Co-operative Corp., Henderson, 125 mi. rural distr. lines, Henderson Co., to Real Electric Co., Owensboro, **$174,421,** Chanaberry Engrg. Co. Inc., 1510 Washington Bldg., Louisville, Zone, 2, engr. CD 8/23—ENR 9/9.

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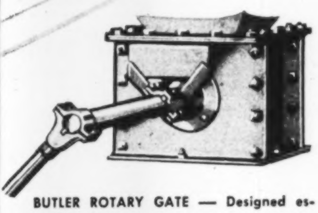

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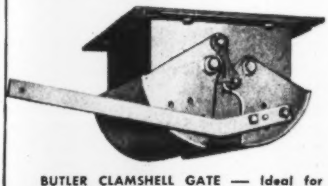

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Kentucky—RURAL DISTRIBUTION LINES—Pennyville Rural Electric Co-operative Corp., Hopkinsville, 197.31 mi. rural distr. lines, Todd Co., to Smith Constr. Co., 1150 Broad St., Nashville, Tenn., **$275,528.** P. M. Sullivan, 905 Stahlman Bldg., Nashville, Tenn., engr. CD 10/22—ENR 11/4.

Mississippi—RURAL DISTRIBUTION LINES—Pontotoc Electric Power Assn., Pontotoc, 156.66 mi. rural distr. lines, Pontotoc Co., to Trans-Electric Co., 106 E. Broadway, Louisville, Zone 2, Ky., **$194,647.** William E. Mailett & Assoc., Jackson, engrs., CD 6/10—ENR 6/17.

Ky., Paducah — DRIVE-IN-THEATRE — Columbia Amusement Co., L. F. Keiler, pres., Paducah, drive-in theare, outskirts of city. Owner builds. **$200,000.**

Ky., Whitesburg — DRIVE-IN-THEATRE—Dr. B. F. Wright, Seco, drive-in-theatre, U. S. Hy. 119, adjacent to Solomon Creek. Owner builds. Est. **$100,000.**

Missouri—RURAL DISTRIBUTION LINES—Grundy Rural Electrica Co-operative, Trenton, labor only, 230 mi. rural distr. lines, Harrison and Mercer Counties, to C. & S. Constr. Co., Shelbina, N. C., **$116,724.** CD 7/1—ENR 7/22.

Mo., Fulton—POWER PIPING, etc.—City, City Hall, power piping and circulating water piping, municipal power plant, to Moffitt & Troop, 4 Smithfield St., Pittsburgh, Pa., **$56,344.** CD 12/2—ENR 1/6.

Nebraska—RURAL DISTRIBUTION LINES—Niobrara Electric Membership Assn., Hay Springs, 2 11.91 mi. rural distr. lines, Dawes and Sheridan Counties, to R. M. Campsey Constr. Co., 25020 Leyton St., Denver, Colo., **$251,411.** CD 2/3/48—ENR 2/19/48.

N. Y., Port Washington — DOCK — Town of North Hempstead, Plandome Rd., Manhasset, dock addn. to Hendrickson Bros. Inc., 63 North Central Ave., Valley Stream, **$134,777.** Bids 2/15. CD 2/2—ENR 2/10.

North Carolina — RURAL DISTRIBUTION LINES—Union Electric Membership Corp., Monroe, 81 mi. rural distr. lines and converting 49.7 mi. line, Union Co., to E. C. Bridges, Heath Springs, S. C. **$215,536.** Bids 11/16. CD 11/5—ENR 11/11.

Oklahoma—RURAL DISTRIBUTION LINES—Cookson-Hills Electric Co-operative, Inc., Stigler, 38 mi. rural distr. lines, Haskell Co., to Weber & Thompson, 2411 Inwood Dr., Dallas, Tex., labor $12,627, materials, $38,000. Total **$50,627.** George C. Hengy & Co., 1007½ Texas Ave., Shreveport, La., engr.

Okla., Norman — STADIUM — University of Oklahoma, Norman, stadium addn. to Harmon Constr. Co., 1138 N.W. 4 St., Oklahoma City, **$970,238.** Bids 2/7. CD 2/11—ENR 2/17. under LB.

South Dakota — RURAL DISTRIBUTION LINES—Butte Electric Assoc. Inc., Newell, 131.75 mi. rural distr. lines, Butte Co. to Ferguson-Diehl Constr. Co., Home State Bank Bldg., Jefferson, Iowa, labor, $39,645, materials, $131,000. Total **$170,645.** CD 11/19/47 — ENR 12/11/47.

South Dakota — RURAL DISTRIBUTION LINES—Moreau-Grand Electric Assn., Timber Lake, 34 mi. 69 kv. transmission line, to Hallott Constr. Co., Crosby, Minn., **$152,303.** Scott Eng. Co., Watertown, engr. CD 8/21/47—ENR 9/18/47.

Tenn., Memphis—POWER LINE—Memphis Light, Gas & Water Div., Memphis, exten. 115 kva power line serving South Memphis, to Shelby Electric Co., 112 E. Iowa Ave., **$678,500.** CD 2/28—ENR 3/3, under LB.

Texas—GAS LINES—United Gas Pipe Line Co., 1525 Fairfield Ave., Shreveport, La., connecting pipelines in Coy City gas field area, Karnes City area, **$100,000**; laying natural gas mains, Laredo area, **$225,000**, force account. CD 12/1—ENR 12/30.

Tex., Carthage — GAS WELLS — Chicago Corp., Carthage, drilling, developing 4 deep earthen wells storage for propane gas, force account. **$90,000.**

Tex., Houston—STREET LIGHTING—Houston Lighting & Power Co., 1016 Walker St., street lighting sys. extens., cables and 800 lights, etc., Purchase and Hire. Approx. **$375,000.** CD 2/28—ENR 3/10.

Tex., San Antonio—FEEDER LINES, etc.—City Public Service Board, 201 N. St. Marys St., gas feeder lines. Approx. **$377,200** and street lighting in outlying districts. Approx. **$80,000,** force-account.

Virginia—RURAL DISTRIBUTION LINES—Shenandoah Valley Electric Co-operative, Dayton, 6 mi. 3 phase tie line and converting 43 mi. rural distr. line, Rockingham Co. to Rockingham Constr. Co., 394 N. Main St., Harrisonburg, **$109,670.** Kinsley, McWharter & Assoc., Staunton, engrs. CD 1/30/47—ENR 2/20/47.

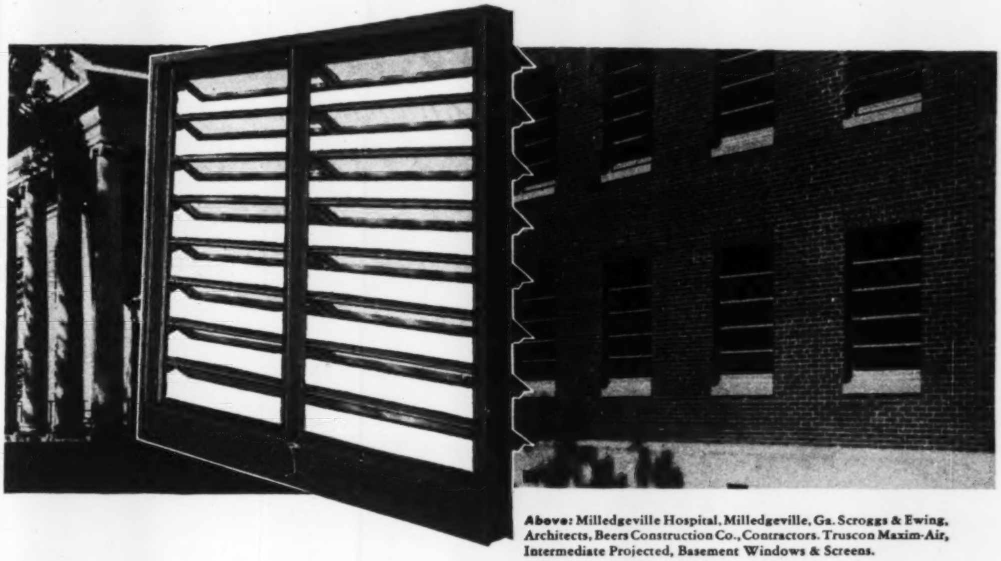
Alta., Edmonton—GAS PIPELINES—North Western Utilities Ltd., Edmonton, 39,000 ft. main piping, 64,000 lead in piping, gas service to West Jasper Pl. area. Owner builds, **$100,000.**

British Columbia — DIKE — Fraser Valley Dyking Bd., 123 W. Pender St., Vancouver, dike, Tilbury Island, to R. G. Guiliami, Ladner, **$75,000.**

B. C., Victoria—PARK DEVELOPMENT—Province of British Columbia, Victoria, park development, incl. roads, lodges, chair lift for skiers, Owner builds, **$328,000,** Dpt. Lands & Forests, Victoria, engrs.

Que., Levis—WHARF—Dominion Govt., Hunter Bldgs., Ottawa, Ont., repairing wharf, east side Levis Ferry, day labor, **$200,000.** CD 8/23/45—ENR 8/30/45.

basis for beauty



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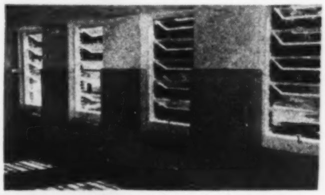

Above: Interior view of Milledgeville Hospital, illustrating complete concealment of operating mechanism on Truscon Maxim-Air Windows.

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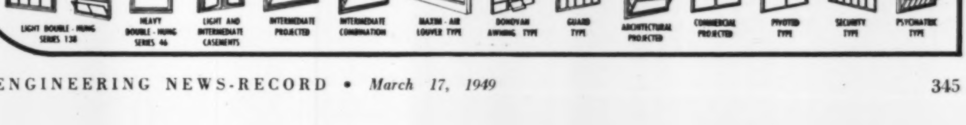
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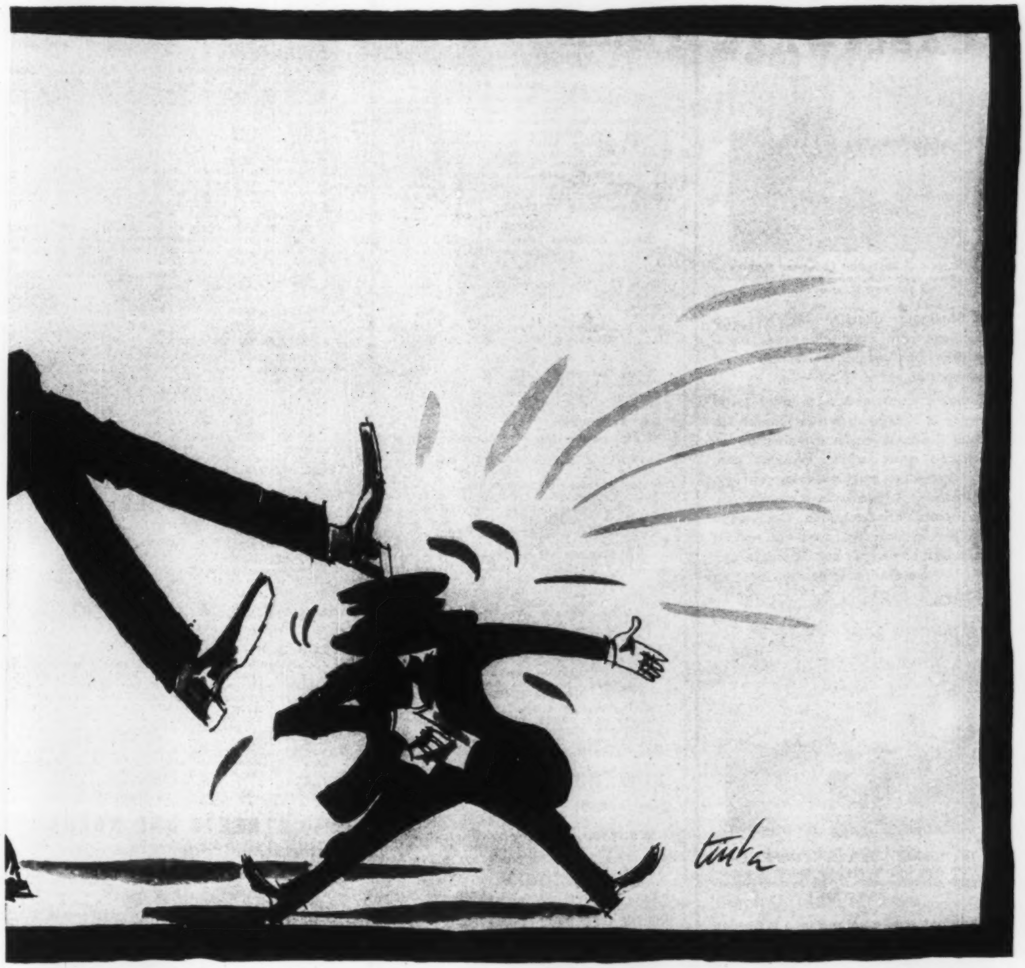

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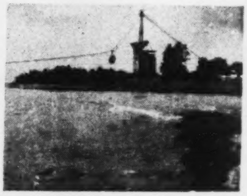

Here is a Sauerman Cableway digging gravel from lake and keeping screening plant supplied at low cost.

A Sauerman Slackline Cableway can increase your output on many excavating jobs while conserving your manpower.

Ranging back and forth over large areas is a digging bucket suspended from a trolley carrier traveling on an inclined track cable. Working continuously, the machine digs, conveys, elevates and dumps in a rapid cycle of operation. Sauerman Cableways deliver a capacity payload with a minimum of cost per cubic yard, in any kind of material, wet or dry, loose or sticky.

This Sauerman Cableway is lifting gravel from river-bed to loading hopper on railway. Operator has easy job loading twelve cars a day.

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CONSTRUCTION REPORTS— Third Section

WATER SUPPLY

BIDS ASKED

March 24

Conn., Hartford—Metropolitan Dist. Water Bureau, Bd. Contr. & Supply, 650 Main St., furnishing 460 tons rein. forcing steel, Contr. 151. Robert Ross, 2 American Row, Hartford, engr.

March 29

La., Gretna—City, c/o C. F. Gelbke, mayor, City Hall, installing 57,300 lin. ft. 6- to 12-in. c.i. water lines. Plans deposit $25.

March 30

Md., Baltimore—Mayor & City Council, City Hall, 12,500 ft. and 30 and 48 in. watermains, appurtenances, under water sections, across Harbor and Patapsco River, 7,000 lin. ft. to be 48 in. flexible joint Metropolitan type c. i. pipe, 4,500 ft. in trench on pile supporting structure, balance in trench land portion to be 48 in. precast rein.-con. pressure pipe, Lazaretto-Fort McHenry, Fairfield Water Mains. Plans deposit $10. L. Small, water engr. CD 12/17/45—ENR 12/27/45.

March 31

Miss., Gulfport—City, c/o City Clk., City Hall, exten. watermains, CD 9/2.

April 4

N. Y., Washingtonville—at office E. J. McLaughlin, village clerk, Washingtonville, laying 7,000 lin. ft. 8 in. c. i. watermain, replacing 1,600 sq. yd. pavement, etc. Plans deposit $15. Harry C. Carpenter, 218 Wisner Ave. Ext., Middletown, engr.; adv. ENR 3/24.

April 6

Tex., Houston—City, M. H. Westerman, secy., new buildings. at Northeast Water Pumping Station and yard piping in area. $490,000. CD 6/30/44—ENR 7/13/44.

LOW BIDDERS

Tenn., Carderview—Carderview Utility Dist., Carderview, Mar. 8, WW improvs., from Alley Constr. Co., Bristol, **$61,931.** CD 2/15—ENR 2/17.

Tex., Farmers Branch—City, City Hall, Mar. 8, water distr. sys., from E. L. Dalton & Co., 3003 Hawes St., Dallas, **$42,672.** CD 2/16—ENR 2/24.

Tex., Lockney—City, R. L. Maggard, mayor, Mar. 1, WW sys. imprvs., from S. E. Lanier, Haskell, **$56,400.** H. N. Roberts & Assoc., 1310 Avenue Q, Lubbock, engrs. CD 1/19—ENR 2/3.

Tex., Luling—City J. N. Brignance, mayor, Mar. 11, water distr. sys., from Ferguson Constr. Co., 5006 2 Ave., Dallas, **$44,857.** Est. $30,000. CD 2/28—ENR 3/3.

CONTRACTS AWARDED

✦N. M., Los Alamos—U. S. Atomic Energy Comn., Los Alamos, water supply imprvs., to Robert Nurseries, Inc., Los Alamos, **$144,302.** Bids 2/23. CD 2/8—ENR 2/10.

N. C., Shelby—City, H. S. Woodson, mayor, changes and addns. to aw water supply sys., to Gilbert Engr. Co., Statesville, **$123,000.** J. N. Pease & Co. Inc., 119½ E. 5 St., Charlotte, engr. Bids 3/4.

SEWERS, WASTE DISPOSAL

BIDS ASKED

March 21

N. J., Livingston—Town, sewerage sys. $160,000. Bowe, Albertson & Assoc., 110 William St., New York, N. Y., engrs. CD 10/17/45—ENR 11/1/45.

March 30

●**Tex., Houston**—City, M. H. Westerman, secy., enlarging Northside Sewage Treatment Plant and construct plant to mfg. fertilizer. $1,000,000. Extended date. J. N. Nagle, city engr. CD 3/8—ENR 3/10.

March 31

Tex., San Antonio—City, Sect. 3, 19,700 lin. ft. 36 in. Salado Creek sanitary sewer main. $275,000. Plans deposit $25. Beavers & Lodal, 1422 Transit Tower, engrs. CD 12/15/47—ENR 12/25/47.

April 19

Conn., Bristol—City, R. E. Rowe, clk., City Hall, Sewers Contr. 6, 15,000 ft. 8-to 24-in. sewers and 2,400 ft. 10 in. c.i. force main. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs.

About May 1

Ala., Montgomery—City, sanitary sewer imprvs. $800,000. Roy Garrett, Shepard Bldg., Montgomery, engr. CD 12/3—12/12.

LOW BIDDERS

Ariz., Phoenix—City, 1 Ave. and Washington St., sanitary sewer addns. to city sys., from Peter J. Foskin Constr. Co., 2329 E. Brill St., **$61,547.** CD 11/29/46—ENR 12/12/46.

Colo., Wheat Ridge—Town, Mar. 8, sewers for South Dist., from Jones & Hezlep, Tabor Bldg., Denver, **$145,635**, est. over $50,000; in North Dist., from Schmidt Constr. Co., Grand Junction, **$438,863**, est. over $28,000; sewage treatment plant, from J. B. Kenney, 3233 Osage St., Denver, **$159,387**, est. over $50,000. CD 3/14—ENR 3/24.

Kan., Sterling—City, City Hall, rejected bids Mar. 3, sewage plant L. B. **$105,500.** CD 2/16—ENR 2/24.

Md., Baltimore—Mayor & City Council, City Hall, Mar. 9, brick, concrete, steel Jones Falls Sewage Pumping Station, from The Frank Angelozzi Constr. Co., 123 S. High St., **$503,978.** CD 2/25—ENR 3/3.

Mass., Framingham—Town, Comr. P. Wks., Memorial Bldg., Mar. 7, sewage pump. station, Lokerville Station, Contr. 2, from Westcott Constr. Co., 52 N. Washington St., North Attleboro, **$52,349.** CD 2/25—ENR 3/3.

Mo., Clayton (St. Louis, Zone 5, P. O.)—City, C. W. Niedner, clk., City Hall, Mar. 8, 2- to 12-in. vitr. clay and rein.-con. storm sewers, East Moorlands Sect., from W. A. Blue Co., 7820 Forsyth St., Clayton, **$80,079**; 12- to 48-in. vitr. clay and rein.-con. storm sewers, DeMun and Wydon Sects., from R. & S. Constr. Co., 7501 Delmar Blvd., University City, St. Louis, Zone 5, **$104,660.** CD 3/2.

Tex., Dallas—City, Earl Goforth, secy., storm sewers in Edgefield Ave., from Austin Road Co., 1,000 Singleton Blvd., **$112,044.** CD 12/1/48—ENR 12/23/48.

Tex., Taylor—City, sewage disposal plant addn., alterations, from Taylor Constr. Co., P. O. Box 648, Taylor, **$76,780.** The Marvin Turner Engineers, Nalle Bldg. Annex, Austin, engrs.

CONTRACTS AWARDED

Calif., San Francisco—Dpt. P. Wks., City Hall, Lake Merced Sewer Sect. C, Spec. 20,340, to M. & K. Corp., 405 Montgomery St., San Francisco, Fredrickson & Watson Constr. Co., 873 81 Ave., Oakland, and Piombo Constr. Co., 1571 Turk St., San Francisco, **$916,485.** Bids 3/2. CD 3/8—ENR 3/10, under L.B.

N. M., Albuquerque—City, Ernest W. Everly, mayor, City Hall, sewage disposal plant, to Allison & Haney, Albuquerque, **$172,099.** Bids 3/1. CD 2/22.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

March 24
Michigan
March 25
Georgia
Kentucky
March 29
Wisconsin
April 7
California
New Jersey
April 22
Alabama

LOW BIDDERS

California—State Div. Hys., Sacramento, Mar. 9, steel beam and steel plate girder bridge and grading, selected material surf. 0.3 mi. approaches across Dillion Creek about 27 mi. north of Orleans, Siskiyou Co., from G. M. Carr & Rocca, 2333 Burbank Ave., Santa Rosa, **$166,432**; bridge, widening culvert and widening plant mix. surf. 0.3 mi. hy. width at Laguna de Santa Rosa and at Purple Draw between east city limits of Sebastopol and 1/3 mi. east of Sebastopol, Sonoma Co., from A. G. Raisch Co., 2048 Market St., San Francisco, **$58,880.** CD 2/14—ENR 2/17.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

March 22
Colorado
Illinois
Wisconsin
March 24
Arizona
Michigan
March 25
Georgia
March 29
Wisconsin
April 6
California
April 7
California
April 22
Alabama

March 24

Tex., Corpus Christi—Nueces Co., George A. Prowse, judge, Courthouse, road constr. on Padre Island, Proj. 1, Park 1. $75,000. J. T. Laurence, co. engr. CD 12/27—ENR 1/20.

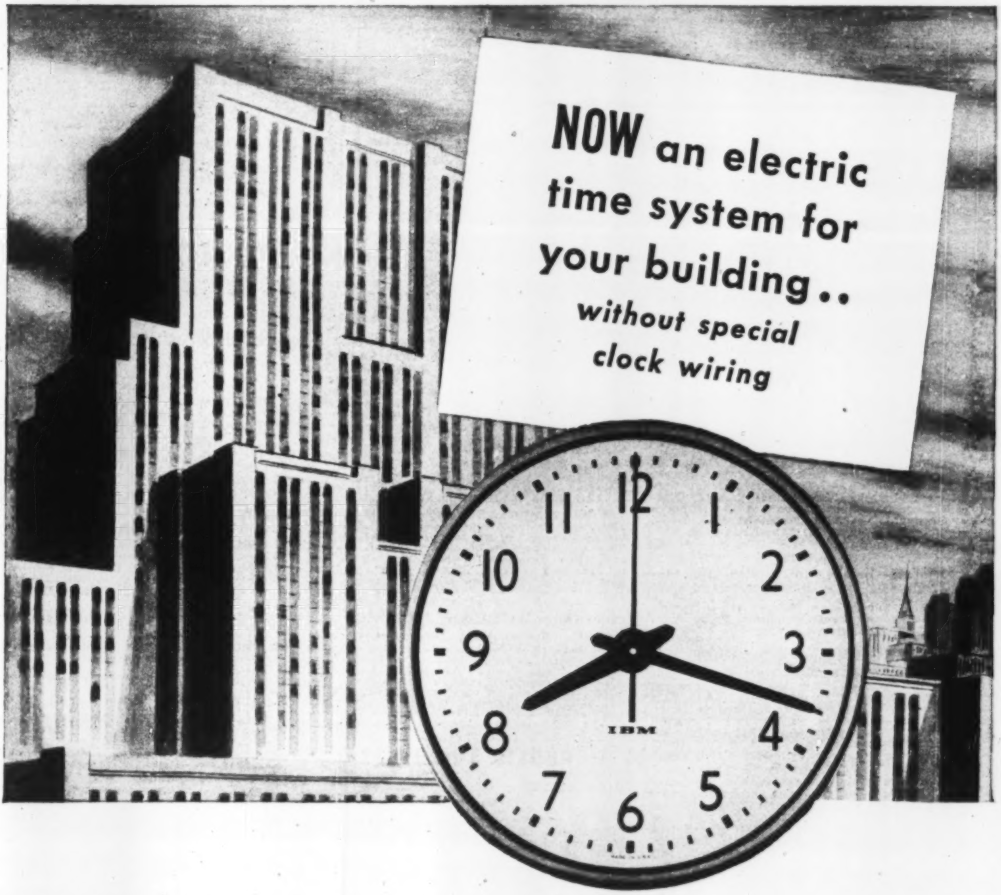
LOW BIDDERS

Tex., Beaumont—Jefferson Co., Courthouse, reconstructing, grading, surf. Sabine Pass, Sabine, Jetty and River Rds. from R. B. Smith, 2301 Southgate St., Houston, **$57,923.** Charles L. Davidson, co. engr.

Tex., Fort Worth—City, W. O. Jones, city mgr., Mar. 8, wid'n., asph. Sylvania Ave., from Texas Bitulithic Co., N. W., 24 St., **$317,657.** Est. $235,000. CD 2/24.

CONTRACTS AWARDED

Calif., Santa Ana — Jennie A. Crutcher Foundation, Inc., c/o Lester Boyle, engr., 328 Spurgeon Bldg., curbs, gutters and streets in Tract 1237, to Sully-Miller Contr. Co., 1500 W. 7 St., Long Beach, **$54,762.** Bids 2/2.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Okla., Tulsa—City, wld'n. Peoria Ave. from 21 to Latimer Sts., to Layman & Co., Riverside Dr., **$228,284.** Est. $229,178. CD 3/3—ENR 3/10, under LB.

Tex., Houston—Harris Co., Hugh A. May, comr. Precinct 2, Courthouse, road constr. and asph. surfacing 4 mi. Ramsey Rd. Purchase and Hire, **$72,000.** Hugo Zapp, co. engr. CD 8/28/47—ENR 9/18/47.

EARTHWORK, WATERWAYS

BIDS ASKED

March 28

Tex., Highlands—San Jacinto Conservation & Reclamation Dist., c/o C. A. Deese, secy., Conroe, reservoir imprvs. incl., 168,000 cu. yd. embankment, appurtenant structures. $35,000. Freese, Nichols & Turner, 2111 Natl. Standard Bldg., Houston, Zone 2, engrs.

March 30

Pennsylvania—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, two silt impounding basins on Schuylkill River Desilting Proj. Basin No. 15, Sanatoga Site and Basin No. 18, Lower Vicent Ste. $600,000. Plans deposit $5 each. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.

April 5

†Wash., Everett—U. S. Eng., 4735 E. Marginal Way, Seattle Zone 4, dredging 110,450 cu. yd. material from shoal areas in harbor.

April 8

†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-a, Denver, Federal Center, Denver, completion Granby Pump Canal, Station 111 plus 00 to Station 158 plus 70, Colorado-Big Thompson Proj. about 12 mi. north of Granby, Spec. 2554. Extended date. L. N. McClellan, ch. engr. CD 3/2—ENR 3/10.

April 12

†Montana—Bureau Reclamation, Dpt. Interior, Hungry Horse Govt. Camp, relocation forest service road, Sect. 2, Station 0 plus 00 to Station 881 plus 00 Hungry Horse Reservoir, 25 mi. southeast Columbia Falls, Spec. 2602. L. N. McClellan, ch. engr.

April 14

†Colorado and Kansas—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, furnishing, del. f.o.b. cars shipping point or f.o.b. cars St. Francis, Kan., two 24 in. hollow jet valves with 2 control stands, 2 intermediate shafts and 1 set wrenches for outlet works at Bonny Dam, St. Francis Unit, Missouri River Basin Proj., Spec. 2606. L. N. McClellan, ch. engr.

†Nebraska and Kansas—Bureau Reclamation, Dpt. Interior, Superior, earthwork, canal lining, structures for Superior Canal, Station 10 plus 00 to 659 plus 50 and Pawnee Lake wasteway channel changes and intercepting drains, Missouri River Basin Proj., Bostwick Unit, near Guide Rock and Bostwick. Spec. 2598.

About April 19

†North Dakota—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, levee and appurtenant works, at Mandan. Serial No. Eng.-32-015-49-79.

Calif., Santa Ana—Bd. Supervs. Orange Co., Courthouse, Mar. 8, 5.86 mi. earth channel incl. bridges, appurtenant structures from south limits of Santa Ana to Newport Bay, from Charles T. Brown Co., 1955 Sixth St., San Fernando, **$122,768.** Est. $153,735. CD 2/25.

†Tex., Corpus Christi—Yards & Docks Annex, Navy Dpt., Arlington, Va., received no bids Mar. 7, dredging 36,00 cu. yd. Navy Crash Channel from Intracoastal Canal to Padre Island. $30,000.

†Virginia—U. S. Eng., P. O. Box 119, Fort Norfolk, Norfolk, Mar. 8, Schedule 1, tainter gates and embedded parts at Buggs Island Dam, Mecklenburg Co. Inv. Eng.-44-110-49-140, from Consolidate Steel Corp., Orange, Tex., **$497,857*****Schedule 2, tainter gates, from Richmond Eng. Co., 7 and Hospital Sts., Richmond, $387,882***Schedule 3, embedded parts, from Palmer-Bee Co., Westminster and G.T.R.R., Detroit, Mich., **$22,990*****Schedule 4, other parts, from Lakeside Bridge & Steel Co., 3200 W. Villard Ave., Milwaukee, Wis., **$56,704.** CD 2/7—ENR 2/17.

†Virginia—U. S. Eng., foot of Front St., Norfolk, Mar. 8, tainter gate operating mechanism at Buggs Island Dam, Mecklenburg Co., from Willamette Iron & Steel Co., 2860 N. W. Front St., Portland, Ore., **$286,067.** CD 1/24—ENR 2/3.

N. J., Long Beach Twp. (Brant Beach P.O.)—State Dpt. Conservation & Economic Development, State House Annex, Trenton, jetty at Shore Rd., to Jesse A. Howland & Sons, Inc., 50 Church St., Sea Bright, **$66,729.** Est. $75,000. Bids 2/14, awarded 2/28.

†Washington—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., 26 stop logs, Columbia Basin Proj., Spec. 2540, Item 1, to Pacific Car & Foundry Co., 120 W. Hudson St., Seattle, **$98,100,** f.o.b. Odair. Bids 2/17, awarded 2/8. CD 2/24—ENR 3/3, under LB.

AIRPORTS AND AIRBASES

BIDS ASKED

March 29

Mass., Gardner—City, J. J. Berlo, chn. Airport Comn., Gardner, access road, landing strip, Gardner Airport, Templeton. Plans deposit $25. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs.

March 30

Mass., North Adams — AIRPORT — City, James A. Bowles, mayor, F. J. Noel chn. Airport Comn., North Adams, landing strip, airport. Over $50,000. Plans deposit $15. Fay, Spofford & Thorndike, 11 Beacon St., Boston, archts. CD 1/6—ENR 1/20.

LOW BIDDERS

●†Calif., Point Mugu—BARRACKS, etc.—R. Lamoreaux, Officer-In-Charge of Constr., U. S. Naval Air Missile Test Center, Point Mugu, Mar. 3, enlisted mens barracks, airfield hangar, telephone exchange bldg. and married officers' and enlisted men's quarters, spec. 20609, from Robert E. McKee, 4700 San Fernando Rd. W., Los Angeles, Item 1, **$1,586,900.** Parsons—Aerojet Co., 411 W. 5 St., Los Angeles, archt. and engrs. CD 2/10—ENR 2/17.

●Ill., Chicago — AIRPORT IMPRVS — City, Dpt. Purchases, Contracts & Supplies, City Hall, Mar. 9, terminal bldg., hangars clearance, runways, utilities, sewers, water supply sys., grading, parking apron, 15 mi. northwest of here, class VIII airport, Chicago International Express Airport, from Arcole Midwest Corp., 3225 Main St., Skokie, Chicago, **$2,093,022.** CD 2/23—ENR 2/24.

Tex., Harlingen—AIRPORT—City, Mar. 9, municipal airport administration bldg., from Cours & Larribee, San Benito, **$79,927.** John G. York, 1220 W. Harrison St., engr.

Wash., Seattle—AIRPORT—Port of Seattle, Bell St. Terminal, Zone 1, 22,500 sq. yd. concrete and 41,000 sq yd. asph. paving at Seattle-Tacoma Airport with timber curbs, piping, chain link fence and landscaping, from Lease & Leigland, Dexter Horton Bldg., Zone 4, **$367,114.** G. T. Treadwell, c/o owner, ch. engr.

CONTRACTS AWARDED

†Calif., Moffett Field (near Sunnyvale)—LABORATORY—National Advisory Com. for Aeronautics, Ames Aeronautical Laboratory, Moffett Field, 2 story 112x156 ft. rein.-con., Ames Instrument Research Laboratory, Inv. A-333, to Carrico & Gautier, 365 Ocean Ave., San Francisco, **$566,087.** Bids 2/24. CD 3/3—ENR 3/10.

PUBLIC BUILDINGS

BIDS ASKED

March 21

N. Y., Syracuse—Dpt. Parks, City Hall, administration bldg. alterations. $200,000. George H. Ketcham, 201 Water St., archt.

March 22

Md., Frederick—Frederick Memorial Hospital, Frederick, masonry, steel, concrete Baker Wing and Boiler House alterations, addns., new North Wing, $450,000. Plans deposit $25. J. R. Edmunds, Jr., 130 W. Hamilton St., Baltimore, archt. CD 2/2/48—ENR 2/19/48.

March 23

Conn., Willimantic—City, Luke Hevrin, chn. Willimantic Housing Auth., Harrington Ave., 16 frame duplex houses. A. H. Sharpe Willimantic, archt. CD 1/3.

March 24

N. Y., Hempstead—Bd. Educ., Union Free School Dist. 1, Hempstead, 2 school alterations. $625,000. Jagow & Heidelberger, 658 Fulton Ave., archts.

Tex., Marshall—Marshall Independent School Dist., Marshall, reconstructing masonry Dunbar (Negro) School and 2 classroom addns. $300,000. Extended date. Preston M. Geren, 905 M. P. Anderson Bldg., Fort Worth, archt. CD 3/7—ENR 3/10.

March 25

●Fla., Gainesville — State Bd. Control, c/o Reynolds, Smith & Hill, 227 Park St., Jacksonville, and Guy C. Fulton, 204 Peabody Hall, Gainesville, assoc. archts., engineering bldg. at University of Florida. Over $1,000,000. Plans deposit $35. Bid date changed. CD 3/24—ENR 3/10.

March 28

Pa., Natrona—School Dist. of Harrison Twp., Natrona, 2 story, 75x120 ft., brick school addn. at Birdville. $250,000. John H. Phillips, 23 Briarcliff Rd., Ben Avon, archt. CD 2/6/48—ENR 2/19/48.

March 29

Conn., Manchester—Town Bd. Educ., town mgr., Municipal Bldg., 1 story 19 room Bunce School, Olcott St., $700,000. Keith Sellers Heine, 73 Oxford St., Hartford, archt. Paul Bemis, 36 Pearl St., Hartford, engr. CD 3/3/48—ENR 3/8/48.

Miss., State Line—State Line Consolidated School Bd., c/o McNair & Archer, archts., Rosenbaum Bldg., Meridian, Consolidated School.

March 31

Mass., Westboro—Commonwealth of Massachusetts, Dpt. Mental Health, Dr. Clifton T. Perkins, comr., 100 Nashua St., Boston, renovation boiler plant, Warren Colony, Westboro State Hospital, Proj. M-113, Contr. 1, Plans deposit $10. Richard D. Kimball Co., 6 Beacon St., Boston, engrs. CD 8/14/44—ENR 8/24/44.

April 8

●N. Y., Port Chester—Port Chester Housing Auth., City Hall, housing facilities. $1,100,000. Frederick G. Frost, 144 E. 30 St., New York, archt. CD 5/21/46—ENR 5/23/46, under LB.

April 9

Fla., Ft. Myers—Lee Co., Ft. Myers, Junior-Senior High School. Over $300,000. James A. Stripling, Child Bldg., Tallahassee, and Richard E. Jessen & Assoc., Ft. Myers, assoc. archts. CD 12/16—ENR 12/30.

April 12

O., Columbus—Ohio State University, N. High St., electrical engineering bldg. $750,000. Plans deposit $25. CD 3/4—ENR 3/17.

On or About April 15

†Ga., Augusta—U. S. Eng., Post Office Bldg., Savannah, Laboratory Bldg. 202 alterations, addns., Oliver General Hospital.

April 15

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, 100x200 ft. concrete slab steel laundry bldg., Spec. 992. Over $68,000. R. E. Shonerd, ch. mech. engr. CD 1/17—ENR 2/27.

April 19

Calif., Calexico—Calexico Elementary School Dist. classrooms, administration bldgs., Rockwood School. $388,000. Extended date. Bowen, Rule & Bowem, 2853 Gilroy St., Los Angeles, Zone 26, engrs. CD 2/21—ENR 3/10.

On or About May 2

†Ga., Fort Benning—U. S. Eng., 2301 Grant St., Mobile, Ala., family-type quarters at Ft. Benning, Serial No. Eng-01-076-49-125. CD 8/16—ENR 9/9.

LOW BIDDERS

Ind., Cannelton—Bd. Comrs., Perry Co. Court House, Bd. Hospital Trustees, C. Zoercher, chn., Tell City, county memorial hospital, from J. D. Jennings, Corp., 235 E. Gaulbert St., Louisville, Ky., **$312,900.** Hawkins & Walker, Elsby Bldg., New Albany, archts. CD 1/26/48 — ENR 2/16/48.

†Md., Camp Detrick—U. S. Eng., 1 and Douglas Sts., N. W. Wash., D. C., 2 story row houses, Serial No. Eng. 49-080-49-76 (20)M, from B. & J. Constr. Co., 3432 Connecticut Ave. N. W., Wash., D. C., **$293,900.** CD 2/18—ENR 3/3.

Mass., Boston—City, Traffic Dpt., 134 North St., Mar. 9, traffic bldg., Southampton and Atkinson Sts., from M. S. Kelliher Co., 294 Washington St. **$476,098.** CD 3/1—ENR 3/3.

Mass., Brookline—Town Bldg. Comm., Town Hall, Mar. 8, north wing, high school addn., Greenough St. and Lowell Rd., from John Capobianco, 44 School St., Boston, **$788,000.** Alternate A **$889,700,** Alternate B **$1,019,700.** CD 2/14—ENR 2/24.

Mass., Canton—Town, School Dpt., Canton, Mar. 7, high school, from James S. Mozzicato, 168 Mystic Ave., Medford, **$540,400.** CD 2/14—ENR 2/24.

Mass., Wareham—Town, Supt. Schools, Wareham, Mar. 5, high school alterations, addn., from Theodore Loranger & Sons, 404 Nash Rd., New Bedford, **$747,390.** CD 2/25.

Mo., St. Joseph—State Dpt. P. Health & Welfare, Sam Marsh, dir., Jefferson City, Mar. 8, brick, concrete, stone infirmary for aged patients, State Hospital 2, from Allen Chambers, 1643 Bellview St., Kansas City, Mo., **$598,604.** CD 2/18—ENR 2/24.

†Neb., Omaha—U. S. Eng., 1709 Jackson St., Mar. 10, veterans hospital addn., for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C., from Rorick Constr. Co., 905 S. 20 St., **$344,641.** Est. $373,320. CD 2/9—ENR 2/24.

●†N. H. Manchester—U. S. Eng., Army Base, Boston, 10, Mass., Mar. 8, boiler house, garage and personnel quarters at veterans hospital, Eng. 19-016-49-69 for Veterans Admin., Vermont Ave. between H and I. Sts. N. W., Wash. 25, D. C., from Davison Constr. Co., 1306A Elm St., **$532,216*****personnel quarters, from Swanburg Constr. Corp., 61 Amherst St., **$285,700*****boiler house and garage, from Frankini Constr. Co., Inc., 26 Mystic Ave., Medford, Mass., **$273,936.** CD 2/2—ENR 2/10.

N. M., Eunice—Lea County Common School Dist. 8, Seth Alston, pres., Lovington, Mar. 1, general contract school addns.: High School alterations, addns., vocational shop and central heating plant, from J. W. Bateson, Irwin Keasler Bldg., Dallas, Tex., **$441,061.** CD 2/10—ENR 2/17.

†N. M., Los Alamos—U. S. Atomic Energy Comn., Los Alamos, Feb. 24, Sect. 4, 5 permanent type steel, concrete block shops and yard bldgs., 2 parking sheds, chain link fencing area, in Zia Transportation Yards, from Robert E. McKee, P. O. Box 1706, Santa Fe, **$760,700,** est. $600,000; Sect. 2, asph. and c. conc. paving and Sect. 3, outside systems of water and storm sewers, from Loudermilk Bros., Los Alamos, **$93,000** and **$86,588** respectively. CD 1/24—ENR 1/27.

●**†N. M., Los Alamos**—U. S. Atomic Energy Comn., Los Alamos, rejected bids Jan. 18, High School, Serial No. 291-49-72, L. B. **$1,080,203.** CD 1/26—ENR 2/3, under LB.

●**†Tenn., Nashville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., Mar. 11, 8 story federal bldg., from Beers Constr. Co., 70 Ellis St. N. E. Atlanta, Ga., **$4,594,000;** installing 8 elevators, from Westinghouse Electric Co., 401 6 Ave. S. Nashville, **$389,100.** CD 2/7—ENR 2/10.

Tex., Panhandle—Carson Co., Panhandle, Mar. 7, 2 story, 75x108 ft., structural steel, masonry courthouse and jail, from Neil Singleton, 514 N. Fillmore St., Amarillo, **$555,875.** Est. $300,000. CD 2/15—ENR 2/17.

Wash., Seattle — City, County-City Bldg., Zone 4, Mar. 9, 1 story, rein.-con. engineering department shop bldg., from Brazier Constr. Co., 309 Pontius Ave., **$320,581.** Est. $400,000. CD 2/16—ENR 2/24.

CONTRACTS AWARDED

Tex., Dallas — Dallas Independent School Dist., Akard & Royal Sts., Leila P. Cowart School, to J. W. Bateson Constr. Co., Irwin-Keasler Bldg., **$597,405.** Bids 3/8. CD 2/7—ENR 2/10.

●**Wash., Seattle**—City, County-City Bldg., Zone 4, City Light Gorge powerhouse addn. and complete penstock tunnel, to Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, Calif., **$3,188,268.** Bids 3/2, awarded 3/9. CD 3/8—ENR 3/10, under LB.

Wis., Merrill — Bd. Educ., Merrill, general contract high school, to Ben B. Ganther Co., 78 State St., Oshkosh, **$555,069.** Bids 2/19. CD 3/2—ENR 3/10, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

March 22

Conn., Bridgeport—Boys Club of Bridgeport, Inc., 231 Middle St., 1 story, bsmnt., 172x178 ft. brick, concrete, steel club, Madison Ave. $325,000. Fletcher Thompson, Inc., 211 State St., archt. CD 1/14—ENR 2/3.

March 28

Pa., Wilkinsburg — Westinghouse Electric Corp., 501 Pennwood Ave., Pittsburgh, 2 story, 60x150 ft. brick, tile, steel frame, steel joist, precast rein.- con. educational center. $450,000. Hoffman & Crumpton, 132 7 St., Pittsburgh, archts. CD 11/4—ENR 11/18.

March 29

●**Conn., Hartford**—St. Francis Hospital Corp., 140 Farmington Ave., hospital addn., $2,000,000. Louis A. Walsh, 111 Main St., Waterbury, archt. CD 11/30/44—ENR 12/14/44.

April 19

●**Tex., El Paso**—Providence Memorial Hospital, Dr. L. L. Evans, supt., 617 Santa Fe St., 6 story, bsmnt., 200 bed steel frame Memorial Hospital and Nurses Home, concrete pier and beam fdn. $1,000,000. Carroll & Daeuble, 1001 E. Yandell Blvd., archts. CD 1/27—ENR 2/3.

LOW BIDDERS

Colo., Ft. Morgan—Ft. Morgan Community Hospital Assn., Ft. Morgan, Mar. 8, general contract, 2 story, bsmnt., 50 bed hospital, from Newstrom-Davis & Co., 2000 W. 8 Ave., Denver, **$288,437.** CD 2/8—ENR 2/17.

Conn., Bridgeport—University of Bridgeport, James Halsey, pres., Mar. 9, 2 story, bsmnt., brick, steel, concrete College of Engineering, Park Pl. and Myrtle Ave., from Otto F. Burghart, Inc., 871 Central Ave., **$424,986.** Est. $400,000. CD 2/24—ENR 3/2.

CONTRACTS AWARDED

●**Calif., Los Angeles**—Compton Park Inc., 6307 Wilshire Blvd., 225 frame, stucco dwellings in Sylmar, Lullaby and Buton Lanes, Tilden and Lennox Aves., Lanark and Titus Sts. Owner builds, **$1,350,000.** Southern Drafting Service, 2424 W. Florence Ave., archts.

●**Calif., Los Angeles** — Pacific Constr. & Finance Co., 5143 Sunset Blvd., 177 frame, stucco dwellings in Van Nuys Dist. Owner builds, **$1,750,000.**

Conn., Derby—Southern New England Telephone Co., 227 Church St., New Haven, 2 story, bsmnt., brick, steel telephone exchange bldg. addn., Olivia St., to W. J. Megin Inc., 51 Elm St., Naugatuck, **$375,670.** Bids 2/10. CD 2/1—ENR 2/3.

Conn., Manchester — Greenbrooke Homes, Inc., 5 Dover Rd., forty-three, 6 room frame houses, Falkner Dr. Owner builds, **$387,000.**

Tex., Garland — Garland Investment Co., c/o Wilson H. Brown, 2711 Inwood Rd., Dallas, 53 residences. Owner builds. **$300,000.** CD 3/11.

Proposal Advertisements see pp. 351-352
Proposed Projects see p. 276

OFFICIAL PROPOSALS

(Additional Proposal Advertising on page 352, 380 & 383)

Bids: March 23, 1949 (905)

Barge Canal Improvement

NOTICE TO BIDDERS

Sealed proposals in duplicate covering construction of

Contract— U. S. 37	Guard Gates, Spillway and performing other miscellaneous work at Herkimer (Mohawk) Herkimer County, N. Y.
Contract— U. S. 64	Guard Gates and performing other miscellaneous work at Little Falls, Herkimer County, N. Y.

will be received by Henry A. Cohen, Director, Bureau of Contracts and Accounts, Department of Public Works, The Governor Alfred E. Smith State Office Building, Albany, N. Y., on behalf of the Department of Public Works until 10:30 o'clock A. M. (Eastern Standard Time) on Wednesday, March 23, 1949, when they will be publicly opened and read.

Each proposal must be made upon the form and submitted in the envelope provided therefor and shall be accompanied by a certified check made payable to the State of New York, Commissioner of Taxation and Finance, of 5% of the amount of the bid as a guaranty that the bidder will enter into the contract if it be awarded to him. The title of the work must be written on the front of the envelope, sealed and delivered to Henry A. Cohen, Director, Bureau of Contracts and Accounts, The Governor Alfred E. Smith State Office Building, Albany, N. Y. The blank spaces in the proposal must be filled in, and no change shall be made in the phraseology of the proposal. Proposals that carry any omissions, erasures, alterations or additions may be rejected as informal. Successful bidder will be required to give a bond conditioned for the faithful performance of the contract and a separate bond for the payment of laborers and material men. Corporations submitting proposals shall be authorized to do business in the State of New York. Drawings and specifications may be examined free of charge at the following offices:

Guy W. Pinck, Deputy Chief Engineer, The Governor Alfred E. Smith State Office Building, Albany, N. Y.
State Architect, 18th Floor, 270 Broadway, New York City.
Lacy Ketchum, District Engineer, 109 N. Genesee St., Utica (1) N. Y.
Wm. Robinson, District Engineer, 301 E. Water St., Syracuse (1) N. Y.
A. R. Mulligan, District Engineer, Barge Canal Terminal, Rochester (1) N. Y.
Charles H. Waters, District Engineer, 65 Court St., Buffalo (2) N. Y.

Drawings and specifications may be obtained from the Director, Bureau of Contracts and Accounts, The Governor Alfred E. Smith State Office Building, Albany, New York, upon deposit of $10.00 for each set.

Refund in full will be made to bidders for one set of plans and specifications returned in good condition within 30 days of award of contract or the rejection of the bids. A 50% reimbursement will be made for the return in good condition, of all other sets of the plans and specifications within 30 days following the award of the contract or the rejection of the bids.

Checks for plans and specifications shall be made payable to the State of New York.

Proposal blanks and envelopes will be furnished without charge.

B. D. TALLAMY, Superintendent
N. Y. State Department of Public Works

Official Proposals Columns
of
ENGINEERING NEWS-RECORD

are MUST reading, each week, for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States.

. . . and used regularly for over 50 years by government, state, county and municipal departments for advertising bids.

Official Proposal Division
ENGINEERING NEWS RECORD
Address: New York 18, N. Y.

Bids: April 4, 1949 (P927)

Transit Shed in Block 10-B

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
CONTRACT PN-14

Sealed proposals for the construction of a Transit Shed building, exclusive of the foundations therefor, in Block 10-B at Port Newark, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, N. Y., until 2:00 o'clock on the afternoon of Monday, April 4, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:45 P. M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $10.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, March 17, 1949.

Bids: April 4, 1949 (P928)

Transit Shed in Block 10-A

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
CONTRACT PN-6

Sealed proposals for the construction of a Transit Shed building, exclusive of the foundations therefor, in Block 10-A at Port Newark, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, N. Y., until 2:00 o'clock on the afternoon of Monday, April 4, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:30 P. M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $10.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, March 17, 1949.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2585) will be received by Bureau of Reclamation, Old High School Building, North Warren Street, Helena, Montana, until 10 a. m., April 6, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of Canyon Ferry Dam and Power Plant, Canyon Ferry Unit, Montana, Missouri River Basin Project. The work is situated on the Missouri River about 16 miles northeast of Helena, Montana. Principal items are approximately: 359,000 cu. yds. of excavation; drilling 63,000 lin. ft. of holes for excavation, grouting, drainage and cores; 455,000 cu. yds. of concrete; installing 6,200,000 pounds of metal pipe, gates, cranes, trashracks and structural steel; furnishing and placing 4,550,000 pounds of reinforcement bars; and other work. Time allowed for completion will be 1,500 days. For particulars, address Bureau of Reclamation, Post Office Box 517, Helena, Montana; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(926)

OFFICIAL PROPOSALS

(Continued from page 351)

Bids: April 6, 1949 **(908)**

Sewer System and Treatment Plant

The Municipal Authority of the Borough of Lemoyne, Penna.

Sealed proposals will be received at the Borough Council Chambers, 332 Herman Ave., Lemoyne, Penna., until 2:00 P. M., E.S.T. April 6, 1949 for furnishing all necessary labor, materials and equipment, and performing all work for the construction of a Sewerage System and a Sewage Treatment Plant and appurtenances, and will there be publicly opened and read at that time. Separate proposals will be received upon two parts of the project as follows:

Sewerage System—including 58,000 lin. ft., 8″ to 18″ vitrified sewers; 24,000 lin. ft., 6″ vitrified sewer house connections; 240 brick manholes.

Sewage Treatment Plant — including Control Building, Primary Settling Tanks, Sludge Digester, Sludge Drying Bed, Chlorine Contact Tank, fencing and specified equipment and appurtenances.

Proposals shall be accompanied by certified checks in accordance with the provisions contained in the Specifications and in the following amounts:

Sewerage System—$30,000
Sewage Treatment Plant—$7,000.

Copies of the Contract Documents, Plans and Specifications may be obtained from Gannett Fleming Corddry and Carpenter, Inc., Consulting Engineers, 600 North Second Street, Harrisburg, Penna., upon deposit of the following amounts for each set:

Sewerage System—
Twenty Dollars ($20.00)
Sewage Treatment Plant—
Fifteen Dollars ($15.00)

Full refund will be made to actual bidders for return of one set in good condition within ten days after closing date for receipt of bids; refund for return of all other sets, in good condition within the same period, will be fifty per cent of the deposit.

The Municipal Authority of the
Borough of Lemoyne, Penna.

Gannett Fleming Corddry &
Carpenter, Inc., Engrs.
600 North Second Street
Harrisburg, Penna.

Bids: April 27, 1949 **(888)**

Correction of ad appearing in 2/24/49.

Laying Cast Iron Pipe Distribution Mains and Appurtenant Work

CLARKSBURG WATER BOARD
CLARKSBURG, WEST VIRGINIA

Sealed proposals will be received for the item listed below by the Clarksburg Water Board at their office in Clarksburg, West Virginia until 10:00 A.M. on the 27th day of April, 1949, up to the hour of opening bids, at which time and place all bids will be publicly opened and read aloud. Bids will be received on the contract covering:

Laying Cast Iron Pipe Distribution Mains.

Approximate quantities:
14,000 lin. ft. of 12″ pipe
6,000 lin. ft. of 8″ pipe
600 cu. yds. of rock excavation

The successful bidder will be required to furnish a satisfactory performance bond in the amount of 100% of his contract. The contract documents, including specifications and drawings are on file at the office of the Clarksburg Water Board, Clarksburg, West Virginia and at the office of Alvord, Burdick & Howson, 1401 Civic Opera Bldg., Chicago, Illinois.

The right is reserved by the Water Board to reject any or all bids or to accept any considered advantage to the Water Board.

Certified check, cash, government bonds, bidder's bond, or bank draft payable to the Clarksburg Water Board, or a satisfactory bid bond executed by the bidder and a surety company in an amount equal to 10% of the bid, shall accompany the proposal.

No bid may be withdrawn after the scheduled closing time for the receipt of bids but bids may be withdrawn at any time prior to the scheduled time for opening bids.

SCOTLAND G. HIGHLAND
Secretary and General Manager
Clarksburg Water Board,
Clarksburg, West Virginia.

.... 1949.

Bids: April 7, 1949 **(925)**

Seaside Heights Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

RT. 37. ISLAND HEIGHTS-SEASIDE HEIGHTS BRIDGE

Construction of the superstructure of the Island Heights-Seaside Heights Bridge, Contract No. 2, on Route 37, in Seaside Heights Borough and Dover Township, Ocean County. The contract consists of the construction of the superstructure for 30 beam spans 73′ in length, 2 girder spans 88′-6″ in length, a double leaf bascule span 101′ in length, and roadway approaches. The principal items of construction are:

Estimated:

3,406	cu. yds. Concrete in Structures
670,000	lbs. Reinforcement Steel in Structures
720,000	lbs. Structural Steel in Bascule Structure
3,600,000	lbs. Structural Steel
58,000	lbs. Machinery
4,000	cu. yds. Embankment
1,870	sq. yds. Pavement, Type A or T
4,818	lin. ft. White Concrete Curb

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Thursday, April 7, 1949 at eleven o'clock (11:00 A. M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: April 14, 1949 **(924)**

Fabrication and Installation of Spillway Gates and Appurtenances

Pursuant to a certain contract between Salt River Valley Water Users' Association and the City of Phoenix dated November 22, 1946, and with the permission of the United States under a separate contract between the United States, the City of Phoenix, and Salt River Valley Water Users' Association dated October 7, 1948, sealed bids for fabrication and installation of spillway gates and appurtenances at Horseshoe Dam on Verde River in Maricopa County, Arizona, will be received by Salt River Valley Water Users' Association at the office of the General Manager in the Water Users' Building at Second Avenue and Van Buren Street, Phoenix, Arizona, until 3:00 P.M., M.S.T., April 14, 1949.

Specifications covering the work to be done and other Contract Documents may be obtained from the Engineer, Leeds, Hill and Jewett at his offices, 742 Security Building, 234 North Central Avenue, Phoenix, Arizona, and 1000 Edison Building, 601 West Fifth Street, Los Angeles 13, California, upon deposit of $25.00, which amount will be refunded upon return of all documents in usable condition within ten days of the date of opening of Bids.

DESCRIPTION OF WORK

The site of the work is at Horseshoe Dam on Verde River, fifty-five miles by road northeast of Phoenix. The work to be done will be within the existing spillway channel, which is approximately 300 feet wide by 700 feet long and to and within which wheeled vehicles of any reasonable weight can be moved freely.

The following work is to be done under a separate contract prior to installation of gates in the spillway: the concrete pavement and walls in the spillway channel will be extended upstream and the six piers required for support of the spillway gates will be built, in which the gate hinge anchors will be embedded.

There will be three radial gates of the bascule type each 114 feet in length by 26 feet in height. Each gate will be supported on two piers located downstream from the gate face and be balanced and be provided with automatic and manual operating mechanisms. The gates will be fabricated of structural steel and will weigh erected about 250,000 pounds each, exclusive of concrete in the balance weights. In addition to the total of 750,000 pounds of structural steel in the gates there will be about 250,000 pounds of other metal work in hinge supports, bridges, control equipment and appurtenances.

SALT RIVER VALLEY WATER
USERS' ASSOCIATION
Phoenix, Arizona

Bids: April 18, 1949 **(914)**

READVERTISEMENT AND
CHANGE OF BID DATE

Paving and Other Construction Broome County Airport Broome County, New York

NOTICE TO BIDDERS

Binghamton, New York
March 11, 1949

1. *SEALED BIDS*, in duplicate, subject to the conditions contained herein will be received until 11:00 A.M., Eastern Standard Time, Tuesday, April 18, 1949, at the office of the Clerk of the Board of Supervisors, Broome County Office Building, Binghamton, N. Y., and then publicly opened and read, for funishing all labor and materials and performing all work for the above-described project in accordance with the plans and specifications.

2. Copies of the plans and specifications may be obtained from the Clerk of the Board of Supervisors, Broome County Office Building, Binghamton, New York, upon payment of a charge of $15.00 for each set requested. Check and money orders should be made payable to the order of the County Treasurer, Broome County, New York.

3. Plans and specifications will be available for inspection at the offices of:

S. P. Carman
Security Mutual Building
Binghamton, New York
and
Seelye, Stevenson & Value
101 Park Avenue
New York 17, N. Y.

4. Certified check or bid bond for a sum of not less than 5% of the bid price will be required for each bid, payable to the order of the County Treasurer, Broome County.

5. Payment and performance bonds in the amount of 100% of the contract sum will be required.

6. The right is reserved, as the interest of the Owner may require, to reject any and all bids, to waive any informality in bids received, and to accept or reject any items of any bid.

7. Envelopes containing bids must be sealed and marked as follows: Bids for Paving and other Construction for Broome County Airport, to be opened at 11:00 A. M. Eastern Standard Time, April 5, 1949.

8. The right is reserved, as the interest of the Owner may require, to revise or amend the plans and/or specifications prior to the date set for opening bids. Such revisions and amendments will be announced by addenda to all prospective bidders.

HOWARD DAVIS
CLERK OF THE BOARD OF
SUPERVISORS
BROOME COUNTY, NEW YORK

(Continued on page 380)

SEARCHLIGHT SECTION

CATALOG

WHERE TO BUY OR RENT

used and surplus new

CONSTRUCTION EQUIPMENT MATERIALS & SUPPLIES

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133 Southampton St. Boston 18, Mass.

NEW ENTERPRISE DIESELS

WITH 300 KW IDEAL A.C. GENERATORS
FOR
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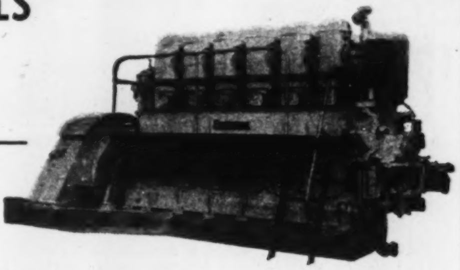

OTHER DIESELS AVAILABLE
UNIT CAPACITIES—10 TO 1420 KVA
A.C.—50 AND 60 CYCLES

A PARTIAL LIST OF OUR INVENTORY

KVA	Make	Model	HP	RPM	KVA	Make	Model	HP	RPM
1420	Fairbanks Morse	38D8⅛	1600	720	312	General Motors	8-268A	450	1200
1250	General Motors	16-278A	1600	720	300	Fairbanks Morse	YVA	360	257
900	General Motors	12-567	1080	720	200	Buckeye	80	240	600
625	Superior	OS	750	327	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	6016-E	90	1200
375	Enterprise	DSG-6	450	450	62	Int'l Harvester	UD-18	76	1200

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46—4 yd. Koppel Quarry Cars
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30—1 cu. yd. all steel Koppel Cars

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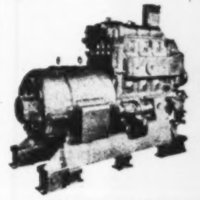

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900 HP, General Motors Model 12-567, Propulsion Unit Complete

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Shovels-Cranes-Draglines, 1-yd. to 5-yd.
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Locomotives, gas & steam, 5 to 80 tons.
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Caterpillar Tractor, Model 30 PS Series w/ side boom.
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For rent.—15 current model cranes, shovels and backhoes, also buckets, frost balls, floats, etc.

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Lorain 82, 1945 Model Shovel & Dragline.
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Osgood Crane, 1945, With new 39" Magnet.
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Lorain 75 Shovel. Diesel.

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(2) Caterpillar D-8's. U-Series. Like new.
(1) Caterpillar D-7, 7M Series. With dozer. Good. $6,800.00.
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(1) D-4 & D-2 with Hydraulic Angledozers.
(1) D-8 in 1H5000 Series. Angledozer. $4,800.00.
(4) DW-10's with 10 yd. CW-10 Scrapers.

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Buckeye Model 410. Like new.
Cleveland Model 95, 110 and 140.
Buckeye Model C-15, 20' x 42" Wide.
P & H Model 10-30.
Parsons Model 310.

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New 2 yd. Blaw-Knox Clamshell. $1400.00.
New 2½ yd. Re-Handling. $1600.00.
New Buckeye Model 70, ¾ yd. Attachment. $875.00.
New Link Belt ⅜ yd. Shovel Attachment. $500.00.
New P & H Model 355 Shovel Attachment. $500.00.
New 22-B Crane Boom. 85%.
Used Lorain 82 Crane Boom. $1,000.00.

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1—Lambert Steel Guy Derrick, 3-section mast 115'; 3-section boom 100' with 20' Steel Bull Wheel, Front Block and Spider. Capacity: 10 Ton Flat Boom, 20-Ton 50' Radius.

ABERTHAW COMPANY
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1—20,000# Vulcan Dbl. Drum AC
1—35,000# Nordberg Sgl. Drum AC
1—10,000# Nordberg Sgl. Drum AC
1—17,000# Ottumwa Sgl. Drum AC
1—10,000# Lidgerwood Sgl. Drum AC
1—16,000# Lidgerwood Sgl. Drum AC
1—15,000# Wash. Iron Wks., Sgl. Drum AC
1—30,000# Allis Chalmers Sgl. Drum AC
1—20,000# Mundy Dbl. Drum, W/o motor

CRUSHERS

2—#800B Pitman, new
1—12x16 Eagle Dbl. Roll
1—3B American Pulverizer
1—30x54 McNally Pitts. Sgl. Roll
1—10x20 Universal Sgl. Roll Portable
1—24x20 Penn. Sgl. Roll
1—#75 Marcy Ball Mill
1—24x20 Dixie Hammer Mill
1—40x22 Pioneer Dbl. Roll with Hopper
1—30x60 Jeffrey Sgl. Roll AC
1—Mead-Morrison Dbl. Roll, 100 TPH, gas
1—Ken. Van Saun Gearless, complete, AC

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Units, 75 to 900 KW with diesel and steam engines

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1—4 yd. P&H Diesel D/L crane, comp.
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Complete new Hetherington-Berner Asphalt Plant—50 to 60 Ton per hour capacity — including electric motors and drives. Available due to owner's change of plans.

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1—Manitowoc Model 3500 high lift shovel, Venn-Severin diesel engine, 45' boom, 35' stick, 2 yd. bucket, new Nov. 1946
1—Northwest Model 80-D shovel, standard boom and stick, Murphy diesel engine, approx. 10 years old; also 80' boom, 2½ yd. dragline bucket
2—Marion 362, 1½ yd. shovels, Caterpillar D-13000 diesel engine, new January 1946, with 60' boom
1—Northwest model 85 dragline, 80' boom, 2 yd. bucket, Murphy diesel engine, year 1940
1—Page model 618 dragline, 110' boom, 5 yd. bucket, Page diesel engine, new January 1945
1—Lima Paymaster on cats., General Motors diesel engine—new Dec. 1945
1—Galion grader, diesel, Model 101, new January 1946
8—Model KR11 International dump trucks, new February 1946, 7½ cu. yd. without top side boards—$2,500.00 each
52—International Model H-542-11C (K-11) cab over engine dump trucks, 7½ cu. yd. without top side boards, 1000 x 20 tires, wheelbase 120", canvas top and side curtains, 4 x 2 drive. Bodies are extra heavy metal; heavy duty Daybrook hoists; Model 450 International engine—$1,200.00 each

(Above equipment located in Somerset County, Pa.)

1—Lima 1201, high lift shovel, 45' boom, 35' stick, Cummins diesel engine, 2½ yd. bucket, new December 1945

(Above shovel located West Virginia)

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MARION—Model #362, shovel 1½ cy. air controls, diesel power. Excellent condition. Nearly new. $25,000.00
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INSLEY—Shovel & Backhoe, ½ cy. Chrysler gas engine—used 200 hours .... $ 9,850.00

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Mississippi 8½ Yd. Dump Wagons—New & Used
Intl. TD-18 Angledozer
Intl. TD-18 & 10 Yd. Scraper
Intl. TD-9 with B.E. Dozer Shovel
Adams Diesel Tandem Drive Graders
B.E. 3 Yd. Hyd. Scraper
Bay City ¾ Yd. Crane & Dragline
P. & H. 1 Yd. Crane & Dragline
Austin Western ⅜ Yd. Crane & Clamshell
Sheeps Foot Rollers
Buckeye D. D. Power Control Unit
Hough ½ Yd. Front End Loader
Trackson Swing Crane on T-9 Tractor

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105'-160'-210'-315' & 500' Gasoline & Diesel Powered Portable Compressors
735' Ing. Rand Stationary Compr. Elec. Power Breakers—Sinker & Drifter Drills—Sump rumps — Saws — Wood Borers — Riveters — Chippers — Tampers — Spades — Sheeting Drivers — Wagon Drills

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Clamshell—Dragline—Concrete—Stone Grabs —Scraper—Tip-over—Orange Peel.

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Jaeger Finishers & Spreaders
Buckeye Finegraders
Form Tampers
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Intl. TD-18 with Trackson Pipe Boom
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½—1—2—& 3 Bag Portable
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High Pressure Jetting
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6 & 10 Ton—3 wheel & Tandem

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Tubular Steel Hoisting Towers—Buckets & Hoppers
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1—27E Smith
3—27E Pavers
2—14E Pavers
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2-Ton 31' span Yale & Towne Cranes
Single drum mine hoists
4-Ton steel stiffleg, hoist & swinger
30 ton steel stiffleg Wiley derrick
2 Car puller hoists
15 Electric overhead hoists
20 New 4-cyl. Continental power units
1 New Murphy ME-46—reasonable
1 Fairbanks Morse 36A 48 HP

BUCKETS

Clamshell & dragline ½-2½ yd.

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Buckeye Model 50, new 1940—Reblt.
Lima ¾ yd. dragline diesel, 1945
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I-R 105, rebuilt
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Rex 6" sure prime, mtd. Waukesha, rebuilt
BUCKETS: Williams 1½ yd., 40E, late model, reblt.
Williams ½ yd. new, gen'l purpose
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P & H 255A; Trench Hoe, new
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full caterpillars with boom and bucket

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8 Lima 34 shovels	¾ yd.
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DRAGLINE BUCKET: Page 4 yd., medium duty, complete.
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PUMP: Worthington 40 H.P. steam driven Centrifugal Pump, 300 lbs. steam pressure, 3550 RPM, with steam regulator; complete, in new condition.
MOTOR: G.E. 40 H.P., 3 phase, 60 cycle, 220-440 volt, 1765 RPM, with V-belt pulleys and belts, starter, etc.
DIESEL GENERATORS: 4—Caterpillar D13000, 6 cylinder, with 74 KW, AC Generators, 3 phase, 60 cycle, 220/440 volt. All complete.
GOODRICH SUPER LONG LIFE CORD CONVEYOR BELT (NEW):
- 1—Piece 1014 ft.
- 1—Piece 1017 ft.
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42″ wide, 6 ply, 42 oz. duck, 7/32″ top cover, 1/16″ bottom cover, on original reels. ALL NEW NATURAL RUBBER; with or without mechanical parts.
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- 1—42″ complete with motor and drive.
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PULVERIZERS: Jeffry 24 x 18 Swing Hammer Pulverizer, shop No. 1159. Hardinge Conical Ball Mill 6′ x 22″, manganese steel lined, Herringbone gears, with motor and V-belt drive.
KILNS, COOLERS, DRYERS: 1—Single shell 34″ x 20 ft. complete with drive, burner; no motor. 1—5′ x 50′ brick lined Kiln.
DERRICK HOIST: National 3 drum, 80 H.P., shop No. 4636, with 15 H.P. separate electric swinger, 3 phase, 60 cycle, 220/440 volt.
SCRAPER HOIST: Ingersoll Rand 50 H.P., 3 drum, 220/440 volt.
MINE HOISTS: Single and double drum, 150 H.P., 250 H.P., 400 H.P., 600 H.P., 800 H.P., 900 H.P. and 1000 H.P. All complete with motors and control equipment.
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- 1—2¼ yd. Link Belt Model K570 Diesel Crane, Ser. No. 2215, with high gantry, hydraulic controlled. Powered by Caterpillar D17000 Diesel engine. Equipped with 80′ boom. For either crane or dragline work. Will handle 2½ yd. dragline bucket.
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- 1—1 yd. Byers Master Model, Ser. No. 3596, powered by 4 cyl. Hercules Model TXO gasoline engine, with 40′ boom.
- 1—1 yd. Erie Gas-Air Model GA-2 combination shovel and crane, Ser. No. 10679, powered with 4 cyl. Waukesha Model WL55 gasoline engine, with 47′ crane boom. Shovel boom 22′, sticks 17′ with 1 yd. dipper.
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- 1—¾ General Model 307, Ser. No. 2575, powered by 71 HP 8 cyl. Chrysler Industrial engine, with 40′ boom.
- 2—¾ yd. Buckeyes, Model 70, Ser. Nos. 5409 and 5411, with 40′ boom, powered by 71 HP Chrysler Industrial gasoline engines.

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4—"Super C" LeTourneau Tournapulls with TLP Carryall Scrapers. Good rubber all around.

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Special Price For Contractors

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15 Ton Ratchet Lever Jack. Automatic Lowering Ratchet Jack. 15 Ton Capacity. Height closed 28" Rise 19". Wt. 94 Lbs. 60" Handle. Extra heavy base with foot forged to the rack bar, insuring maximum strength at this point. Jack handles easily because it is in perfect balance when lifted by convenient handles.

$15.75 Ea Lots of 50

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Hein-Werner or Walker 5-ton Hydraulic Jacks. Height 9". Rise 9"⅛.

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WALKER 5-TON JACK

Double screw jack, unused. Complete with handle. Height 8½". Rise 10". Rugged malleable construction. Gears operate on large ball bearings.

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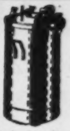

5 Gal. **$39.50 Ea.**

10 Gal. **$57.50 Ea.**

Complete with gauges and pop-off valve. 110 Lb. Pressure, Used but in good condition.

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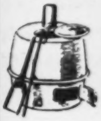

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Same as those used by Army as tent stoves. Burns coal or wood. Ideal for heating small garages, for campers or sportsmen. Comes complete with shovel, poker and shaker. Heaters are rusty and require blacking to look like new.

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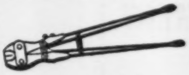

Length 26". Treated with protective coating. A highly serviceable tool with sure positive action.

$5.50 Each
LOTS OF 4

$5.00 Each
DOZEN LOTS

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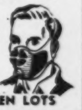

For painters and workers in dusty places. May be worn with goggles. Adjustable head straps. Washable. All rubber with grey felt.

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$2.40 Dz. 5 DOZEN LOTS

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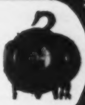

5 TON NEW

Spur geared. Ball bearing. Highest quality steel, $237.50 value.

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BALL PEIN *New* HAMMERS

Fine Quality Hammers. Hardwood handles. Made by Leading Manufacturers.

16 OZ.	20 OZ.
$9.00 Doz.	$12.00 Doz.

FIRE HOSE

USED, Per Foot 35¢

50-ft. lengths. Canvas hose, lined with rubber. 2½" male and female brass couplings. With Underwriter's label.

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This trailer is excellent for mounting air compressors, welders, and light plants. Also a utility trailer which can be attached to a pick-up or passenger car for all sorts of light tools, equipment and material hauling. Capacity 1 ton. Four pneumatic Firestone tires, size 6:00x9. Timken bearing wheels; heavy steel frame. Originally designed for the army as a bomb trailer.

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"D" HANDLE SHOVELS

Short "D" handle. Round point. New. Treated with protective coating.

$9.00 Doz.	$7.50 Doz.
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New 300-Lb. ANVILS

Rugged and strong — fine quality smooth finish. 32¼" long—16" high.

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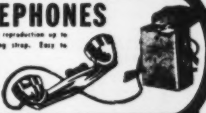

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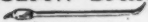
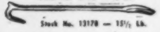


Stock No. 13178 — 13 Lb.



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New, but shelfworn. Two styles. 13 Lb. and 15½ Lb. 1⅛" Diameter. 43" Long. Manufactured for government as railroad car door opener and fire bar. Hook and claw ends. Adaptable for all heavy use.

$9.00 Per Doz. Government fixed price to dealers — $4.00 Each.

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6 OR MORE

$7.50 Each
50 OR MORE

Ladders are new, but shelfworn from storing in warehouse. A sensational buy — act quick! A durable, convenient ladder strongly constructed of selected spruce. Steps supported by ⅛" truss rods and hardwood block. Bottom step supported by angle braces. Complete with bucket shelf board. Back legs are cross doweled and braced with center rail.

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Swivel base, replaceable serrated jaws. Anvil. Pipe jaws included on all except 5" models. (Not War Surplus)

2½"	$4.10 Ea.	4"..	$7.25 Ea.
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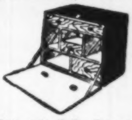

Easily worth $25.00. Waterproof. Sturdily built. Metal bound fiber case 30" wide, 25" high, 16" deep. Three drawers, four pigeon holes. Solid brass pull handles. Two brass ink wells. Take insides out and use for trunk. Used, but in excellent condition.

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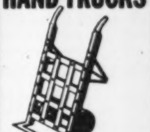

Type "D" Heavy duty-steel bound. Length of handles — 60", Width 23", Nose 7". Size of wheels (Steel), 11" x 2⅛". Weight approx. 110 lbs. Used. Good condition.

$5.75	$7.50
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CROW BARS

Used. 5 Ft. — 17 Lb. Pinch point. Solid cast steel. *For general use.* EXCELLENT CONDITION.

$12.00 Doz.

MORE OUTSTANDING BARGAINS

Wood Mauls, New; 16 Lb. Choice of Steel Bound or Laminated	$9.00 Dozen
Rail Tongs, New; Weight 17½ Lbs. Length 42"	$1.00 Each Minimum Order 6
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Monkey Wrenches, New; "Pexto" 12" Wood Handle	$10.20 Dozen
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Breast Drill, New; Miller Falls No. 120-B. 2 speed	$4.75 Each
Wedges, New, for Pneumatic Hammers, Length 24". Diameter 1⅛". 6" Shank, Wedges 2" x 2" x 12"	$21.00 Dozen

Hundreds of other bargains available. Write for descriptive literature or outline your requirements and we shall quote prices.

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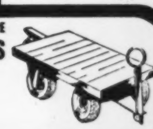

48" long; 30" wide; 20" high. Complete with trailer hitch. Made by Chicago Caster Co. Used, but in excellent condition.

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CROSS CUT SAWS

$2.50 Each

5-FT. ONE-MAN. Tuttle tooth. Assorted makes. "Disston" and "Atkins". NEW but shelfworn. Cast steel straight back. Packed by Government in Cosmolene.

MINIMUM ORDER — SIX

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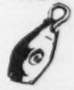

McKissick 8" Sheave. Ball bearing. For Cable up to ½". Same size Block also available for ⅝" Cable. Specify size desired when ordering.

$12.00 Dozen

TERMS: Net 10 days to rated concerns. Others please send check with order. All items F.O.B. Cincinnati unless otherwise specified.

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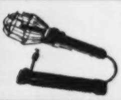

BRAND NEW. Rubber handle with push-switch. Heavy metal guard with reflector. Heavily insulated cable. (Not War Surplus).

25 FOOT	50 FOOT
$1.75 Each	$2.75 Each

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In guaranteed good operating, mechanical condition, ready for work

1—Dual Drum 34E Koehring Paver
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1—Flexplane Finishing Machine (Heltzal) 22 ft. steel wheels, Waukesha motor
1—Jaeger Finishing Machine 20 to 25 ft.
1—Jaeger Finishing Machine 20 to 25 ft. Type H, Waukesha motor.

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Complete Dual Drum Paving Outfit for $25,000.00

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—Model 25 Northwest Crane 6529
—250 Bbl. Butler Cement Bin
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Two Heil Model C12 Scrapers
12 Cu. Yd. Capacity—Condition Good.

Two Gardner Denver Wagon Drills
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25-Ton Tractor & Trailer
Combination as follows:
Rogers D25D Platform semi-trailer
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All equipment located at White Plains, N. Y.

CIRCLE CONSTRUCTION CORP.
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10" road forms, aggregate batcher bin, cement unloader & batcher bin, Loraine 40 with shovel and backhoe, 34E paver & other items for complete concrete paving outfit.

L. F. COLLIGNON
Davenport, Iowa

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ALL LATE MODELS

1 P&H Shovel, 1055 LC, 2½ c.y. New Aug. 1948
1 P&H Shovel, 1055, 3 c.y. New Aug. 1948
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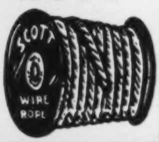

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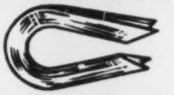

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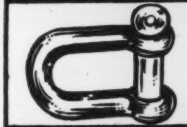

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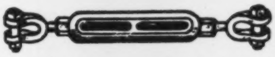

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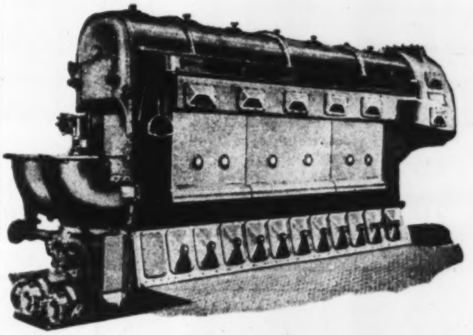

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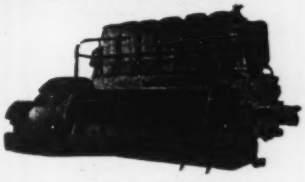

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2	1600	General Motors 16-278A	720	1250	1000	Elliott	3	60	2400/4160
*1	500	Fairbanks Morse Type Y	257	415	415	Fairbanks Morse	3	60	2400
**3	450	Enterprise DSG-6	450	.....	250	Elliott	..	DC	120/240
1	385	Ingersoll Rand "S"	600	.....	250	General Elec DC	..	..	250
2	225	Ingersoll Rand "S"	514	.....	150	General Elec. DC	..	..	250
**2	240/200	Buckeye Model 180	600/500	200/166	160/133	Burke	3	60/50	240-480/230-400
**3	125	General Motors 6016-E	1200/1000	75/62.5	60/50	General Elec.	3	60-50	127/220-230/400
1	100	International UD-18	1200	62.5	50	Westinghouse	3	60	240
2	90	General Motors 6-71	1200	....	60 KW	Delco DC	..	..	120/240
**2	52	International UD-14	1200/1000	37.5/32.5	30/25	Elec. Mchnry.	3	60/50	127/220-230/400
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80' Boom 15' Jib
LORAIN 40 DIESEL CRAWLER
Crane, Dragline, Shovel, Backhoe
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Equipped with Bucyrus-Erie Bulldozer. Serial TDF 21980.

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Equipment has been used
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3—Super C Tournapulls (less than 1,000 hours)
1—New D-8 Push Cat, power unit (500 hours)
$55,000.00 complete outfit
3—Super C Tournapulls (A-1 Condition)
1—C Tournapull
1—D-8 Push Cat, power unit
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15—Tractors and Scrapers
1—80-D Northwest Shovel with 55 ft. Crane Boom, has moved only 125,000 yards
5—11 yard White Tandem Dump Trucks (Now being re-conditioned). Will sell all together lump sum of **$65,000.00**

FS-8339, Engineering News-Record
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11—100 KW., 250/275 V. D.C. Delco Generators dir. con. to 150 HP., Model GBD-8, 5½x7, 8 cyl. Superior Diesel Engines, elec. starting with muffler, power panel and accessories.

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2—37½ KVA. 220/440 V. 3 ph. 60 cy. Buda Lanova Diesel.

3—25 KVA. West 1 ph. or 3 ph. Al Le Roi Gasoline.

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ONLY USED FOR SPARES

AIR COMPRESSOR

6—240 CFM Westinghouse type 3 VS-23 3 cyl. vert., 150 lbs. pres. dir. con., to 50 HP., 220/440 or 2200 v. 3 ph. 60 cy. West Slip Ring Motors, auto. control. Can furnish D.C. Motors or Oil or Gasoline Engines if desired.

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200—1½ Ton HAND CRANKED ratio 27:1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of ¼" cable, ratchet type brake, push button release.

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**Motors 220/440 volt or 2200 volt
3 phase, 60 cycle**

No.	KW	Make	RPM
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1	200	Westinghouse	720
2	200	Westinghouse	1200
1	100	Westinghouse	700
1	100	General Electric	900
1	100	Westinghouse	600
1	100	General Electric	1800
1	100	Reliance	580
1	100	Delco	1200
2	90	Westinghouse	680
4	75	Westinghouse	720
1	75	Westinghouse	1200
1	60	Westinghouse	1200
1 NEW	50	General Electric	1800
3	40	Westinghouse	900
2	30	Westinghouse	720

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Duquesne Electric & Mfg. Co.
PITTSBURGH 6, PA.

DIESEL-
GENERATORS

5 KW TO 1000 KW
NEW-USED
RECONDITIONED

J. PARKER THOMPSON CO., INC
507 FIFTH AVE., NEW YORK 17, N. Y
MURRAY HILL 7-6547

FOR SALE

50-B—Bucyrus-Erie
PILE DRIVER

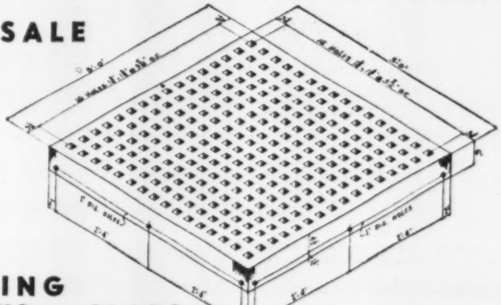
50-B, Bucyrus-Erie, crawler, oil burner, complete with 50-C Super-Vulcan Pile Hammer purchased new recently. 75 ft. sectional boom and leads with telescopic struc for driving batter piles, also purchased new recently. Machine also equipped with shovel, dragline, clamshell attachments.

Latest model machine with cast-steel rotating base and crawler truck frame.

Available immediately.

CHARLES L. VENICE
P. O. Box 5027 Ancon, Canal Zone

FOR SALE



BENDING BLOCKS or SLABS

These blocks or slabs are 5 ft. x 5 ft. as shown. They are semi-steel, in good condition, having only been slightly used on a war-time contract in a shipyard. They are very useful for many purposes, such as for bending table, for layout & assembly work, etc. We also have stands for single blocks, and multiple stands to carry 2, 4, or 8 blocks. We can sell the blocks with or without the stands.

Orders accepted for single blocks or large quantities, as desired.
Write, Phone or Wire at Once!

ACORN IRON & SUPPLY CO.
915 No. Delaware Ave.
Philadelphia 23, Pa.
Phone: WAlnut 2-7070

SURVEYING INSTRUMENTS

USED • REBUILT • SALE • RENT • REPAIRING

Our Craftsmen do

INSTRUMENT REPAIR AND OVERHAUL

- Complete department—handles all makes.
- Experienced craftsmen do all work.
- Includes thorough overhaul, cleaning, oiling and adjustment.
- Precision work guaranteed.

DAVID WHITE COMPANY
317 W. Court St. • Milwaukee 12, Wis.

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service. We will also *buy* your old instruments or take them in *trade*. A complete line of Engineering Instruments and Equipment for field or office. Write for catalog N.R.-93

WARREN-KNIGHT CO.
Manufacturers of Sterling Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

GURLEY

SURVEYING INSTRUMENTS

NEW • REBUILT

Replace your platinum wire or spider web reticle with the exclusive new Gurley *glass* reticle.

Patterns to suit every surveying need.

W. &. L. E. GURLEY
Union Plaza, Troy, New York

SPECIALIZED REBUILDING

of surveying and engineering instruments
All makes and models expertly repaired in modern shop All work guaranteed

USED REBUILT INSTRUMENTS

for sale or rent

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46 JOHNSON AVE INDIANAPOLIS 19 IND

SURVEYING INSTRUMENT

REPAIRS

ALL MAKES
ECONOMICAL - EFFICIENT SERVICE
Agent for David White Company

THE GRAF-APSCO COMPANY
5868 Broadway Chicago 40, Ill.

FROM STOCK

Brand New & Rebuilt

TRANSITS & LEVELS

Fully equipped modern shop—all makes and models repaired — all work guaranteed — instruments rented

Midwest Representative: W. & L. E. Gurley

NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

ALL MAKES

RE-BUILT
REPAIR
RENT
REAL EXPERTS

BUFF

69 Dey St., New York

TRANSITS and LEVELS

Immediate delivery on expertly rebuilt, well-known makes. All makes of instruments repaired. Work guaranteed

Write for used instrument list today

J. H. WEIL & CO.
1325 CHERRY ST. PHILADELPHIA, PA.
GURLEY REPRESENTATIVES

★TRANSITS
LEVELS
REBUILT BY
QUALIFIED EXPERTS
PROMPT SERVICE
GUARANTEED WORK
(BUFF and BUFF AGENTS)

INSTRUMENT SALES
325 W. Huron St. Chicago 10, Ill.

TRANSITS LEVELS

Rebuilt
Repaired
All Makes

BRUNSON

Rented
Bought
Sold

- Patented Ball Bearing Base installed on any instrument gives "Longer Lasting Accuracy."

BRUNSON INSTRUMENT CO., INC.
1405 Walnut St., Kansas City, Mo.

If there is anything you want
that other readers can supply
OR . . . something you don't want—
that other readers can use—
Advertise it in the
SEARCHLIGHT SECTION

FOR SALE

COAL HAULERS

3—Part Model 120 Coal Haulers With 25 Ton Austin Western Trailers

ALSO

315 Ingersoll Rand Diesel Air Compressor
Barber Green Loader, Model 552, #12 Caterpillar Motor Grader

REID-HOLCOMB CO. INC.
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INDIANAPOLIS 21, IND.

FOR SALE

Electric Motors 75 H.P. up
Controls—Transformers
PUMPS
Vacuum units
Wellpoint dewatering systems

Since 1922

WM. W. LEE & SON
20 E. Jackson Blvd.
Chicago 4, Illinois
Phones: Harrison 7-7592, 7-1720

GENUINE BURLAP SAND BAGS

With the string at top.

Suitable for barricading, bulkheading, flood control, fire control and shipping.

ACORN BAG AND BURLAP CO.
915 No. Delaware Ave. Philadelphia 23, Pa.
Phone: WAlnut 2-7070

FOR SALE

1 Lorain shovel 80, purchased Jan. 1948
1 Manitowoc model 3000B, new 1948 2 Yd. shovel with D-17000 caterpillar engine.
2 End dump trucks model 49FD, purchased new 1948.

FS 7844, Engineering News-Record
330 West 42nd St., N. Y. 18, N. Y.

FOR SALE

P&H MODEL 250—

1939 with 80' Boom 6 30' Jib, Mott Haven Mounting with 6-BQ Mack Motor. Excellent Condition. Price $15,000.00.

LEE CRANE SERVICE INC.
33 Island St., Boston 19, Mass.

PIPE

(Additional Pipe advertising on opposite page)

Cast Iron B & S
PIPE and FITTINGS
STEEL PIPE and VALVES

ACORN IRON AND SUPPLY CO.
915 No. Delaware Ave., Philadelphia 23, Pa.
Phone: WAlnut 2-7070

PIPE

If It's Made — Ask ALBERT!

DISTRIBUTORS FOR

- **PIPE**
  - Steel (all types)
  - Wrought Iron
  - Cast Iron
  - SPEED-LAY Pipe Systems
- **VALVES**
  - Reading Pratt & Cady
  - O.I.C. Forged
  - Cooper Alloy All Stainless
  - Steel—Brass—Iron
  - Special Alloys
- **FITTINGS**
  - Tube-Turn Welding Fittings
  - Tube-Turn Forged Steel Flanges
  - Grabler Screwed Fittings
  - Dresser Couplings
  - Victaulic Couplings
- **PILING**
  - ARMCO
  - Youngstown
  - Pile Points
  - Cobi Pile Tips

IF IT'S PREFABRICATED — ASK ALBERT

Our shops are equipped to cut, bend, coil, weld, bevel, thread and test to your most minute requirements. Experienced men make your layouts and consult with your engineers. Experienced men do the fabrication and behind it all you have ALBERT'S years of efficient service.

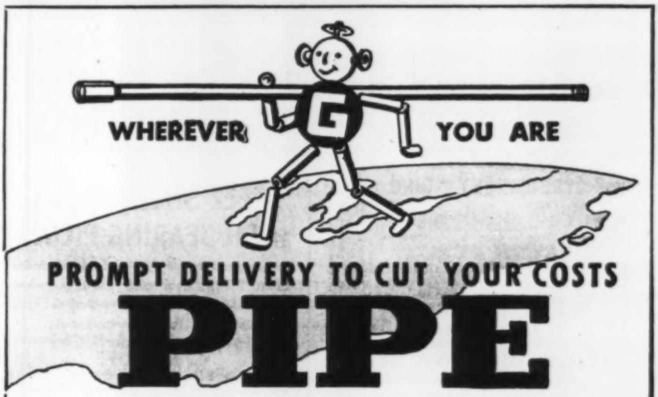
ALBERT PIPE SUPPLY CO., Inc.
No. 13th & Berry Streets, Brooklyn, N. Y. EVergreen 7-8100

FOR SALE
IMMEDIATE DELIVERY
Cast Iron Water Pipe & Fittings
150 - lb. pressure—B&S A.W.W.A. STANDARD
NEW PIPE—4-inch, —6-inch, —8-inch, 10-inch, 12-inch
RECONDITIONED—12-inch, 16-inch, 20-inch, 24-inch
VALVES—All sizes—New and Reconditioned.
FLANGED PIPE— 6-inch New, 8-inch New, 10-inch New, 12-inch. Reconditioned, 14-inch Reconditioned
C.I. WATER PIPE FITTINGS—All kinds and sizes.
SOIL PIPE—from 2 inch to 15 inch and Fittings.
Immediate delivery
TAGCO, INC.
111 Front St. Hempstead, L. I., N. Y.
Hempstead 2-5535-8857

STEEL PIPE
1300 ft.—5½" with couplings
Located Chicago.
Invite rigid inspection
DONALD B. MAC NEAL, Inc.
12100 S. Loomis St. Chicago 43, Ill.
Pullman 5-3411

6" STD. LINE PIPE
40,000 ft. 6⅝" O.D., 18.97# Seamless, 40 ft. random lengths, ends beveled for welding, used, good condition. Located near East St. Louis, Ill.
HORWITZ PIPE & STEEL CO.
Ph. 2-9128 Tulsa, Okla.

WROUGHT Steel Pipe
FITTINGS
VALVES
BOILER
TUBES
ALBERT & DAVIDSON PIPE CORPORATION
2nd AVENUE . . 50th-51st STREET
BROOKLYN 32, N. Y.
Windsor 9-6300



PROMPT DELIVERY TO CUT YOUR COSTS
PIPE
ALL SIZES CUT AND THREADED TO SPECIFICATION
VALVES AND FITTINGS
NEW—USED
STEEL—WROUGHT IRON—CAST IRON—
CULVERT—SPIRAL WELDED—STRUCTURAL
FLANGED—SCREWED—WELDING FITTINGS
IRON BODY—BRASS—STEEL VALVES
GREENPOINT IRON & PIPE CO., INC.
BOGART AND STAGG STREETS
Phone EVergreen 6-7200 Brooklyn 6, N. Y

RAILS—TIES

TRACK ACCESSORIES

EVERYTHING FOR THE TRACK FROM
SWITCH TO BUMPER

R. R. TIE PLATES
Excellent . Relay
100,000 6½" x 9½" for use with 70# to 80# Rails
50,000 7½" x 10½ for use with 85# to 115# Rails

MORRISON RAILWAY SUPPLY CORP.
RAND BLDG. BUFFALO 3, N. Y.
EMPIRE BLDG. BIRMINGHAM 3, ALA.

New and Relaying
RAILS and ACCESSORIES
Motor Gang and Maintenance Cars
ACORN IRON AND SUPPLY CO.
915 No. Delaware Ave. Philadelphia 23, Pa.
Phone: WAlnut 2-7070

NEW—RAILS—Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.

M. K. FRANK
480 Lexington Ave. *New York, N. Y.*
Reno, Nevada
Park Bldg. Pittsburgh, Pa.
Carnegie, Pa.

RAILS
New & Relay
Track Accessories - Steel Storage Tanks
W. H. DYER CO. INC.
1859-X Railway Exchange Bldg.
St. Louis 1 Mo.

EVERY ISSUE
EVERY WEEK

Advertising of USED and Surplus New Construction Equipment is now accepted for all issues in the

SEARCHLIGHT SECTION of ENGINEERING NEWS-RECORD

PILING

We do a Nation-Wide business in
USED **STEEL SHEET PILING** NEW
RENTED BOUGHT
700 pcs. 27-32 ft. Beth. ZP32—Texas
80 pcs. 70 ft. Beth. DP2—Illinois
170 pcs. 50-60-65 ft. Carn. M112—Missouri
90 pcs. 60 ft. Carn. M116—Alabama
1300 pcs. 20-50 ft. Beth. SP-4—Georgia
Other lengths & sections at various locations
Nos. 0, 1, 2 Vulcan Pile Hammers and Driving Rigs
No. 7 9B3, 10B3, 11B3 McKiernan pile hammers
Nos. 400 and 800 Vulcan Pile Extractors
50-C and 80-C Super Vulcan Pile Hammers
All sizes Pile Hammers & Extractors for Rent
Regardless of location of your job, wire or write
MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., St. Louis, Mo.
"WE BUY STEEL PILING FOR CASH"

FOR RENT
STEEL SHEET PILING
CANDLER AND BASS
Birmingham Theatre Bldg.
Birmingham, Mich.

WANT BUY
ALL SECTIONS
STEEL SHEET PILING
DARIEN CORP.
60 E. 42nd St. N. Y. 17, N. Y.

FOR SALE
STEEL SHEET PILING and H-BEARING PILING

Large quantity of "Z" and M-115 Steel Sheet Piling, new and used, together with large tonnage of H-Beams and Bearing Piling for immediate sale.

Owned and offered by General Contractor.
R. M. LUFF
c/o City Waterworks Plant
Douglasdale Road Richmond, Virginia

New And Used
PILING
STRUCTURAL STEEL
ACORN IRON AND SUPPLY CO.
915 No. Delaware Ave. Philadelphia 23, Pa.
Phone: WAlnut 2-7070

Watch—
the *Searchlight Section*
for
Equipment Opportunities

RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-FERROUS SCRAP
BOUGHT-SOLD
LIQUIDATED
DULIEN STEEL PRODUCTS Inc.
of Washington
9265 E. Marginal Way • Seattle 8, Wash. • LAnder 6000

STEEL CONCRETE TOWER

Steel Concrete Tower in 10'9" Sections with Tower Hoppers, Tower Buckets, Catheads and Braces, 1 cu. yd. capacity.

ABERTHAW COMPANY
133 Southampton St. Boston 18, Mass.

FOR SALE
Steam Locomotive Crane

1—40 Ton, 60' Boom, 60" Mass standard & A.S.M.E. Boiler, Serial #3671, Mfd. by The McMyler Division of the Industrial Brownhoist Corp. Price $9200.00
Located near Boston, Mass.

HARLAND G. RICE, INC.
880 River Road Edgewater, N. J.

FOR SALE
Martin Model 10, Serial 3288
CARRYHAUL TRAILER

Bed 8 x 14. Tires dual front and rear 8.25x20. 7" Rim. Hydraulic lift Ramp. Warner Electric brake. One owner; like new.

SCHMIDT BROS.
2493 Johnstown Rd. Columbus, Ohio
Evergreen 9673

FOR SALE

Model 65 Byers ½ yd. back-hoe and drag-line combination 35' boom, bucket, Buda power, all in excellent condition. Location Arlington, Va. Price $5250.00.

Write, Wire or Phone.
H. C. LAWRENCE, Kitty Hawk, N. C.

FOR SALE One Fordson Loader, One D-7 with angledozer, One Osgood Combination Crane & Shovel, One AC Model L Tractor with Baker Blade.

FS-8314, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

Caterpillar D82U352 Bare Tractor like new
Caterpillar 12 Patrol 8T—100 HP., also 7T.
Caterpillar D7 Traxavator
2 Allis Chalmers Bare Tractors HD19s
LUKE MILLER
335 Southwest Boulevard
Victor 6312
Kansas City, Missouri

FOR SALE
No. 5 Industrial BROWNHOIST

gasoline operated 8 wheel locomotive crane, full steel cab, 50 ft. boom, 25 ton capacity with 1½ yard 2 line clamshell bucket. Unit new 1933. New engine installed 1941. Now in operation. Phone for further details.

WIGGLESWORTH MACHINERY CO.
199 Bent St., Cambridge — KI 7-5242

RENTAL STEEL SHEET PILING *New and Used*
Large Stocks Available at Warehouses & Field Locations
PILE HAMMERS AND EXTRACTORS FOR RENT
L. B. FOSTER CO. NEW YORK PITTSBURGH SAN FRANCISCO HOUSTON CHICAGO
ADDRESS THE FOSTER OFFICE NEAREST YOU

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • *OPPORTUNITIES* • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

(Not available for equipment advertising)

$1.20 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.

INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.00 a line an insertion.

INFORMATION.

BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS received by March 23rd appear in March 31st issue subject to limitations of space available.

ENGINEERS

SANITARY AND STRUCTURAL

Excellent opportunities for immediate permanent employment with a progressive organization. Experience essential in sanitary and/or structural design, specification writing and report preparation for water and sewage treatment plants. Engineers experienced in valuation and rate studies also needed.

Desirable working conditions at salary commensurate with ability. Write for application blank. All replies will be held confidential and will be promptly acknowledged.

CAPITOL ENGINEERING CORPORATION

DILLSBURG, YORK COUNTY PENNSYLVANIA

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—ENGINEERS, Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

STRUCTURAL DETAILERS—Checkers. Paid holidays. Vacation. Ralph Rinker, 572 Bellevue Ave., Trenton 8, New Jersey.

WANTED MECHANIC familiar with all types of heavy road equipment, batch plant setups, must have own tools. Good proposition. Will go anywhere in New York state. P 8211, Engineering News-Record.

WANTED, SEVERAL engineering graduates, under 35, by large industrial fire prevention organization maintained by leading insurance group. Permanent position. Periodic inspections and special consulting service for leading industrial plants. Thorough training. P 8063, Engineering News-Record.

WANTED—GENERAL Construction Superintendent on a large housing project. Must be good organizer and capable of assuming full responsibility of the actual construction as well as the coordination of all subcontracted trades, P 8102, Engineering News-Record.

SUPERINTENDENTS AND high-class Foreman for concrete bridge work, pile driving and earthwork, by a well established company in the northeastern area. Steady work and advancement to the right men. P 8117, Engineering News-Record.

WELL ESTABLISHED retail firm has position open for structural engineer between the ages of 30 and 40 who is familiar with concrete structures. College degree in engineering and at least five years field experience or experience with structural engineering firm required. Applicant must be capable of supervising construction and experienced in designing and detailing of concrete. Must be free to travel, headquarters in Atlanta. Southeastern resident preferred but not required. Give full details of educational and business history in letter of application. P 8130, Engineering News-Record.

WANTED — ENGINEER-Superintendent for General Contractor, operating in Mich., near Detroit. Sewer, water and conduit lines. Must be able to estimate. Please state age, experience and salary expected. P 8184, Engineering News-Record.

WANTED—YOUNG engineer for quantity record and survey work for contractor on California Central Valley Canal construction. P 8244, Engineering News-Record.

(Continued on page 378)

CONSTRUCTION EXECUTIVE

Reputable Building Organization, location New York, seeks services of experienced man as Assistant to the President. Background must definitely indicate knowledge of estimating, purchasing, general supervision, and administrative ability. College degree desirable, but not essential. Age limit, 45 years. Reply in full confidence, giving complete details and earning ability for past five years. Enclose snapshot, not returnable.

P-8229, Engineering News-Record
330 West 42nd St., N. Y. 18, N. Y.

Large insurance company has opening for

ENGINEERING CONSULTANT

in connection with its Mortgage Loan and Real Estate Department. Must have knowledge and experience in construction of commercial buildings and be conversant with costs and appraisal methods. Give complete details including education, experience, salary, age and photo. Reply

P-8197, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

WANTED

Young Engineer—Under 40

with practical experience in construction and estimating cost of work for position with contracting company in central and eastern states. Write full information concerning qualifications, experience, previous salaries, and yearly compensation expected. Include photograph if available.

P-8186, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

WANTED—Mechanical and Structural Engineers For designing and detailing work on concrete reinforcement, structural steel and hangar door construction. Requirements are three to four years practical experience or recent graduation from technical school. Desirable working conditions and opportunities for advancement. These openings are with a nationally known steel fabricating company, located in eastern Ohio. Applicants will please submit a record of their qualifications.

P-7737, Eng. N-R, 520 N. Mich. Ave., Chicago

Engineering Designers

Several men for layout of Conveyor Equipment for handling heavy bulk material such as ore, coal, coke and stone for Steel Plant Installations. Should have broad experience in the design of Belt Conveyors, Hoppers and Chutes and also layout knowledge of enclosing building and gallery requirements.

Write for application form or give complete information of your past experience, including compensation earned and expected.

ARTHUR G. McKEE & CO.
2300 Chester Ave.
CLEVELAND, 1, OHIO

WANTED

Civil Engineer or Supervising Contractor

To close and contract licenses with installers, contractors and applicators of special rubberized bituminous materials in great demand for buildings, roads, sewage disposal plants, etc.

Patents have been granted; grantee has pioneered in the construction field for over 30 years.

Commissions on sales either through your own specifications or effort, or dealer sales will be paid in the territory. Commissions remunerative and continuous. State territory you can cover; also do you specify materials on certain construction work.

RUBBERIZED OIL PLASTICS CO.
(Not Inc.)
6049 W. 65th St. Chicago 38, Ill.

AIR CONDITIONING ENGINEER

Thoroughly experienced in the engineering, design and selection of air conditioning equipment and installations for office buildings and industrial applications. Knowledge of modern equipment; its characteristics, economic application, also comprehensive knowledge of duct work, contractors and builders practices highly desirable. Salary commensurate with experience. Some travel involved. Give complete record education, experience, age, availability. Location New York City.

P 8074, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

A COURSE OF INSTRUCTION BY MAIL IN

STRUCTURAL ENGINEERING

Thirty-ninth Year

(In the following list, Courses A, B, and C are abbreviated from our complete Structural Engineering course).

A—Public Works Structures.
B—Architectural Engineering.
C—Special Course (State Board Exams. for P.E.)
D—Structural Engineering (complete).
E—Preparatory Course (for non-technical men).

Our courses have helped thousands of men to better positions.
Information sent without obligation. WRITE TODAY

WILSON ENGINEERING CORPORATION

College House Offices • Harvard Square • Cambridge, Mass., U. S. A.

REFINERY CONSTRUCTION SUPERINTENDENT WANTED

Minimum 5 yrs. experience in full charge of refinery construction. Salary range, $9,000 to $15,000. Location California. Furnish complete record and photo.

P 7954, Engineering News-Record
68 Post St., San Francisco 4, Calif.

HELP WANTED—MALE

LANDSCAPE FOREMEN

Our jobs consist of out-of-town large public housing projects per plans and specifications—as well as roadside improvements on highway work, various states, which work involves large quantities placing top soil, seeding, sodding, planting, etc.

Reliable, capable, bondable men, between 40-50 years of age, with practical experience to run jobs will find our proposition lucrative and permanent.

Write giving full experience, references, and recent snapshot of yourself.

WILFRED ROADSIDE IMPROVEMENT CORP.
475 Fifth Avenue New York City

WANTED BY

LEADING MANUFACTURER OF EXCAVATING MACHINERY

Young ambitious man with Civil Engineering training and some field experience in excavation work to learn our business. To the qualified man this will mean a permanent position with excellent possibilities with this long established Chicago concern. Write giving complete details.

P-8334, Engineering News-Record
520 North Michigan Ave., Chicago, Ill.

CONSTRUCTION SUPERINTENDENTS

Large engineering organization desires construction engineers. Must have considerable recent experience in steam-electric power plant construction, and be thoroughly qualified to direct field layout work, preparation of construction reports and specifications for subcontracts. Submit complete experience record.

P 8075—Engineering News-Record
330 W. 42 St., New York 18, N. Y.

SALESMEN WANTED

Old line construction and industrial machinery distributor desires one or possibly two salesmen for established territory in Kentucky. Give experience, age, educational background with full particulars.

SW-8345, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT

(Continued from page 377)

WANTED: MAN between 25 and 35 to take charge of service station construction for small Independent Oil Marketing Company. Must be able to work from blue print and should have some drawing ability. Should be free to travel, Ohio, Pennsylvania and West Virginia P 8272, Engineering News-Record.

WANTED—AN experienced estimator for an established Philadelphia concern for large sewers, tunnels and bridges. State salary, experience, and when available. P 8285, Engineering News-Record.

ENGINEERS: LARGE college offers $3000, approx. half time teaching-studying. All ranks univ. positions, experienced $4500-$6500 nine months. Give phone, photo, qualifications. Cline Teachers Agency, East Lansing, Mich.

WANTED: TESTING Engineer, experienced in laboratory and field testing of construction materials particularly concrete, asphalt paving and soils. P.E. license desirable. Location Ohio; position permanent. State age, education, experience and salary. P 8293, Engineering News-Record.

WANTED—CONCRETE Technician to establish a research laboratory on large project, study materials and methods, prepare mix designs and be responsible for quality. P 8336, Engineering News-Record.

INTERESTED SECURING services of competent experienced piping draftsman having fair knowledge of power piping standards for permanent employment in Midwest engineering organization. Communicate P 8327, Engineering News-Record, regarding salary and details of experience and submit brief digest of experience. Position will not require man to take independent charge but opportunities will be offered to develop under competent leadership.

DRAFTING ROOM Supervisor. Experienced FHA subdivision and land surveying practice. Steady employment. Metropolitan Long Island. P 8367, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

ALASKA SALES Representative wanted by nationally known manufacturer of portable gasoline-engine-driven pumps, generators, chain saws, electric paving breakers, etc., selling to contractors, railroads, utilities, mining and pulpwood industries on commission basis. Exclusive territory. State qualifications, references, experience. Company official will come to Anchorage in April for interviews with qualified applicants. Write Homelite Corporation, Port Chester, New York.

(Continued on opposite page)

LEARN TO ESTIMATE

Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

The Tamblyn System of Estimating will make a real estimator out of you in a few weeks of your spare time. We are so sure that you will want to learn it, that we will send you our complete home study course for ten days examination absolutely free. If you don't think it is the finest thing you ever saw, just return it and it won't cost you a cent. If you like it and want it, send us $8.75 when 10 days are up and $7.50 per month until $38.75 is paid.

This estimating system is based on forty years of actual construction experience. It has been sold all over the world for more than twenty years. Thousands of estimators and contractors swear by it. Our offer isn't hot air and big talk. We don't give you a diploma or a lapel button, but we do teach you down to earth estimating which will bring you profitable business.

Just send your name and address today, and we will mail you the complete course at once for your approval.

TAMBLYN SYSTEM
1115 So. Pearl St., E-272
Denver, Colo.

Napoleon once said
"An Army Marches on Its Stomach"

We Have Fed Millions

KANE INDUSTRIAL SERVICE

Industrial Feeding.
Labor Camps.
Labor Camp Equipment.
Free Employment Agencies.
30 Years' Experience in the Housing and Feeding of Men for Satisfied Clients.
Abundant Labor Supply available for Large Projects Anywhere.

VALENTINE B. KANE & ASSOCIATES
1410 State St. New Haven 11, Conn.

Don't forget the

BOX NUMBER

When answering the classified adveritsements in this magazine don't forget to put the box number on your envelope. It is our only means of identifying the advertisement you are answering.

SALES OPPORTUNITY WANTED

Established civil and structural engineers desire to contact producer or manufacturer as sales, estimating or construction representative in Ohio and/or West Virginia. Registered engineers with excellent engineering and sales background.

SA-8286, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

Continued from opposite page)

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CIVIL ENGINEER, 20 years heavy construction experience and engineering sales. Eight years tropics. Speak excellent Spanish. Office Manager last position. Available immediately. Foreign or domestic. PW 8243, Engineering News-Record.

EXECUTIVE ACCOUNTANT—C.P.A. (NY) offers broad experience in accounting matters, taxes and office management. Age 46. Excellent references. PW8119, Engineering News-Record.

CIVIL ENGINEER—Young, Aggressive. One year experience with water front construction company New York City. Now working for American Oil Co. in South America. Desires job abroad or in USA. Perfect knowledge Spanish. PW 8109, Engineering News-Record.

ENGINEER-EXECUTIVE, twenty-two years experience in practically all types of industrial, commercial and government projects. Civil Engineer, age 42, experienced in the supervision of both design and construction. Last salary $13,000. Good references. Available immediately. PW-7984, Engineering News-Record.

CIVIL ENGINEER, Registered, Experienced design and construction chemical plants, oil refy., plant layout, drydocks, piers. Capable office man. Domestic or foreign. Available immediately. PW-8196, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, industrial plants, conveyor systems, coal tipples and coal separation, quarry installations. Age 53, twenty-five years of continuous construction experience. Graduate engineer. PW-8224, Engineering News-Record.

PARTY CHIEF, Designer, Instrument man wants position as assistant county or city engineer, or with consulting engineer or contractor. PW 8223, Engineering News-Record.

CIVIL ENGINEER, B.S., P.E. & L.S., 29, single; employed. Experienced in industrial building construction, also housing, sewers, streets, surveys. Desire responsible job in field or office as contractors engineer, architects representative, or plant engineer for construction and maintenance. Can handle field design, estimating, supervision. Some experience on installation of chemical plant and power house equipment. $5200 to start. Prefer East but other locations considered. PW-8210, Engineering News-Record.

GENERAL SUPERINTENDENT or Superintendent available. 25 years. Broad experience supervising and estimating. All types of paving, heavy-excavating, large-sewers, water and gas main construction, air-ports, earth-fill dams, many other classes of construction. Cost conscious, prefer middle west or west. Sober, honest, reliable, best references. PW 8212, Engineering News-Record.

GENERAL FOREMAN, 20 years experience. Reinforcing steel, drainage, and underground electrical duct line construction. Available at once. Go anywhere if permanency and adequate compensation assured. References furnished. PW 8290, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: over 15 years experience in commercial, industrial, and governmental work. Excellent references. PW 8317, Engineering News-Record.

SUPERINTENDENT, CONSTRUCTION, 20 years of wide experience on housing projects, sewage treatment plants, hospitals, schools, industrial and commercial bldgs., age 46, willing to travel, prefer eastern Penna. or New Jersey. PW 8359, Engineering News-Record.

BUILDING: PROJECT or Construction Manager also General Superintendent; 30 years experience full charge of large projects, years actual experience cost clerk; estimator; purchasing; closing; manager; general and job superintendent; all types of structures and allied construction all kinds of contracts. PW-8198, Engineering News-Record.

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POSITIONS WANTED

CIVIL STRUCTURAL Engineer, registered. Design and fabrication background. Available for supervising position only. PW 8298, Engineering News-Record.

CONTRACTORS ASSISTANT, Chief Estimator desires permanent connection with General Construction Company. Considerable experience in managing contracts covering buildings, bridges, waterworks etc., under highly competitive conditions. PW 8297, Engineering News-Record.

CONSTRUCTION EXECUTIVE: Professional Engineer with broad experience in project development from inception to completion involving design, specifications, estimates, supervision of construction, negotiating and award of contracts, inspections, cost analysis, scheduling and job co-ordination. During past eight years experience has involved the development and construction of an aggregate of forty major industrial projects and prior on varied types of projects such as banks, hotels, schools and office buildings, fertilizer, sulphuric acid plants; rubber; paper mills; harbor; port improvements; sewage disposal and water systems. PW 8350, Engineering News-Record.

LANDSCAPE ENGINEER, 29, B.S. in Landscape Architecture. Experience planning, survey layout, and development of parks, house and apartment developments. Little or no travel desired. Location immaterial. PW 8365, Engineering News-Record.

FIELD SUPERVISOR or Foreman: 20 years exp. all types excavation, grading, drainage and surfacing. Buildings, highways, airports, levees, dams. Know how to handle equipment and men. Cost conscious, age 42, married, steady. Write to C. E. Kerlin, Port Trevorton, Pa.

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CIVIL ENGINEER—Graduate, Registered, age 39, desires connection with construction or engineering firm in supervisory capacity. Wide experience in general construction, principally industrial buildings and facilities. Interested in position of responsibility. PW 8356, Engineering News-Record.

PLANT ENGINEER, M.E., Graduate, married, age 30, 30 months plant engineer, job estimating, maintenance, plant construction, production surveying. 5 years air craft and engine maintenance. Desire permanent position. PW 8333, Engineering News-Record.

LABOR RELATIONS and Personnel Director-36-Broad experience in construction industry. Excellent contacts with officials of international building trades unions, building trades department and government labor agencies. Thoroughly familiar with federal labor statutes affecting construction industry. PW 8366, Engineering News-Record.

BUSINESS OPPORTUNITY

Wanted: Purchaser of part interest
in reputable construction corporation in Southwestern N. Y. State qualification, financial responsibility. Answers confidential. Address BO 8351, Engineering News-Record.

SUPERINTENDENT of CONSTRUCTION

Thoroughly experienced General building, Hospitals, Heavy construction, Reinforced concrete, Estimating and Purchasing. Would consider a financial interest after a trial period. Reg. Professional Engineer. Mem. ASCE.
Only Reliable Contractors considered.

BO-8328, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

U. S. Government

(Continued from page 352)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2596) will be received by Bureau of Reclamation, Lewiston, Idaho, until 10 a.m., April 1, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of the water treatment plant at Lewiston Orchards, Idaho. The work is situated approximately 6½ miles southeast of Lewiston, Idaho. Principal items are approximately: 25,000 cu. yds. excavation; 2,000 cu. yds. construction embankment; 15,000 cu. yds. backfill; installing miscellaneous filter equipment and furnishing and installing filter house; and other work. Time allowed for completion will be 180 days. For particulars, address Bureau of Reclamation, Lewiston, Idaho; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(919)

OFFICIAL PROPOSALS

Bids: April 17, 1949 **(920)**

Water Works Improvements

CITY OF WINSTON-SALEM,
NORTH CAROLINA
NOTICE TO CONTRACTORS

Sealed proposals addressed to the Purchasing Department will be received and publicly opened and read aloud by the Secretary to the Board of Aldermen in the Council Chamber at the City Hall, City of Winston-Salem, North Carolina, until 2:00 P.M., E.S.T., April 7, 1949, for:

(a) *CONTRACT NOS. 1 AND 2*—the construction of a 36" diameter water transmission main from the Yadkin River at Idols to the Salem Filter Plant, a distance of approximately 68,600 lineal feet.

(b) *CONTRACT NOS. 3 AND 4*—the construction of a 48" diameter water transmission main from the Salem Reservoir to the Salem Filter Plant, a distance of approximately 8,800 lineal feet.

(c) *CONTRACT NOS. 5, 6, AND 7*—the construction of an intake structure and pumping station along the Yadkin River at Idols.

(d) *CONTRACT NO. 8*—the construction of a 725,000 gallon capacity standpipe at Station 150+00 along the transmission main between the Yadkin River and the Salem Filter Plant.

(e) *CONTRACT NOS. 9, 10, 11, 12 AND 12A*—the construction of alterations and additions to the existing 12 M.G.D. Salem Filter Plant and Pumping Station to enlarge it to a 20 M.G.D. Plant.

(f) *CONTRACT NOS. 13 and 14*—the construction of cement-lined, cast iron water supply and distribution system piping in Winston-Salem, North Carolina. Approximately 4,000 lineal feet 18" and approximately 6,705 lineal feet, 24". Approximately 6,960 lineal feet, 12". Approximately 930 lineal feet, 8".

(g) *CONTRACT NO. 22*—the construction of a one million gallon capacity elevated steel water storage water tank in the Ardmore District of Winston-Salem, North Carolina.

Copies of the plans, specifications and other contract documents are on file and open to public inspection at the office of John D. Spinks, Consulting Engineer, Nissen Building, Winston-Salem 3, North Carolina; at the office of Albright & Friel, Inc., Consulting Engineers, 1528 Walnut Street, Philadelphia 2. Pennsylvania, and at the office of the Director of Public Works, City Hall, Winston-Salem, North Carolina; and sets of documents may be obtained during any business hour at any of these offices upon paying a deposit of $10.00 for each set of documents on any one contract. If the documents are returned in good condition within five (5) days after the opening of bids, the full amount of the deposit for one set will be refunded to each actual bidder; and other deposits will be refunded with a deduction of $5.00 to defray the actual cost of reproduction of the sets of documents. If the said documents are not returned within the time stated, the entire amount of deposit will be forfeited.

Each proposal shall be accompanied by a deposit with the Secretary of the Board of Aldermen of cash or a certified check payable to the City of Winston-Salem on some bank or trust company organized under the laws of the State of North Carolina of an amount equal to not less than two (2%) per cent of the amount of the proposal, said deposit to be retained by the City in event of withdrawal of bid after public opening, or if the successful bidder shall fail to execute the contract within ten (10) days after the award, or give satisfactory surety. The proposal shall be irrevocable after the public opening and cannot be withdrawn after that time, and said deposit shall be forfeited to the City of Winston-Salem as liquidated damages, if the bid is withdrawn after the public opening, or if the bidder fails to execute formal contract and provide satisfactory surety within ten (10) days after the award. All bids which are not accepted within thirty days after the public opening shall be deemed rejected and the deposit shall be returned to the bidder.

A surety bond of one hundred (100%) per cent of the amount of the contract shall be required for the faithful performance of the contract and to idemnify the City against loss due to defective workmanship, materials and appurtenances for a period of one year. Premiums are to be paid by the Contractor and bond to be endorsed by a State representative. The Surety must be a substantial surety company satisfactory to the City and authorized by law to do business in the State of North Carolina. The Board of Aldermen of the City of Winston-Salem, North Carolina, hereby reserve the right, to refuse and reject any or all bids; and the said Board of Aldermen also reserve the right to waive any informalities in bids received.

No bid may be withdrawn by the bidder for thirty (30) days after the scheduled closing time for the receipt of bids.

Consideration will be given only to bids of Contractors who submit evidence showing that they are licensed under "An Act to Regulate the Practice of General Contracting" ratified by the General Assembly of North Carolina on March 10, 1925, and as subsequently amended.

BY ORDER OF THE MAYOR AND
BOARD OF ALDERMEN, CITY
OF WINSTON-SALEM, N. C.
RALPH L. DIXON
Secretary, Board of Aldermen

Bids: March 30, 1949 **(921)**

State Road Work

STATE DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONTRACTS & ACCOUNTS
ALBANY, NEW YORK

Sealed proposals will be received by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., until ten-thirty o'clock a.m., eastern standard time, on WEDNESDAY, March 30, 1949, for projects in the following counties:

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Bronx	$20	$150,000	Conc. & Steel Viad. App. Misc. 0.07 Mi. Conc. 0.23 Mi. 9" thk., 2 at 36'	0.30	$2,625,000
Broome	5	9,000	Asph. Conc	3.93	159,000
Columbia & Rensselaer	10	100,000	Conc. 9" Thk., 2 at 25', 4' mall	5.78	1,695,000
Delaware	10	12,000	Reinf Conc. Slabs 40', 40', 37' Steel Beam 62' Asph. Conc. Opt.	0.40	208,000
Erie	5	6,000	Asph. Conc.	2.13	104,000
Livingston	5	17,000	Asphalt Conc.	7.45	315,000
Madison & Oneida	10	30,000	Welded Girder Span 115'; Misc. 0.06 Mi.; Conc. 2.90 Mi. 9" Thk. 24' Wdt.	2.96	559,000

This project involves the use of Welded Girder Alpha Construction and is patented; the royalty being $64.75.

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Monroe	5	25,000	Cant. Deck Girder 2 at 84'; Anchor Spans 2 at 44'; Suspended Span 1 at 100' (Canal Bridge)	0.37	484,800

This project involves the use of I-Beam Alpha Construction which is patented and the royalty is $60.27.

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Monroe	5	6,000	B. M. Road Mix	2.61	102,000
Monroe & Ontario	10	30,000	I-Beam 4 Spans 2 at 47'; 2 at 87½'; Rig. Fr. Span 34'; I-Beam 4 Spans 2 at 38'; 2 at 57½' D. S. T. Gravel	0.16	516,000

This project involves the use of I-Beam Alpha Construction which is patented and the royalty is $308.00.

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Montgomery	5	4,500	Bit. D.S.T. Grad Gravel	2.20	77,000
Nassau	5	4,000	I-Beam Widen.	0.04	73000

This project involves the use of I-Beam Alpha Construction which is patented and the royalty is $154.00.

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Onondaga & Cayuga	5	30,000	Thru Truss 312' Span: 4 App. Spans I-Beams at 75' each Conc. 0.12 Mi. Asph. Conc. Opt. 0.31 Mi. (Canal Bridge)	0.43	529,030

This project involves the use of I-Beam Alpha Construction and is patented; the royalty being $209.72.

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Orange	20	180,000	Rigid Frame, 2 Spans 54' each; Rigid Frame 50' Span; Rigid Frame 44' 10" Span: Built up Beam Span 97'; Conc. 9" Thk. 2 at 36'	1.48	3,050,000
Orange	5	23,000	I-Beam Span 47½' Conc. 8" Thk., 24' Wide	0.41	399,000

This project involves the use of I-Beam Alpha Construction which is patented, and the royalty is $56.00.

County	Deposit plans	Bid deposit	Type	Miles	Engineer's estimate
Rensselaer	5	7,000	Asph. Conc.	4.54	124,000
Schenectady	5	6,000	Asph. Conc.	2.84	106,000
Suffolk	5	11,000	Reinf. Conc. I-Beam tot. 165' Stabilized App.	0.23	184,000
Westchester	10	44,000	Conc. 9" Thk., 2 at 25'	2.52	790,000

Maps, plans, specifications, and estimates may be obtained at the office of the Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers in whose district the roads are located. The name and address of the District Engineers will be furnished on request.

Plans may be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. Tallamy
SUPT. OF PUBLIC WORKS

(Continued on page 383)

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OFFICIAL PROPOSALS

(Continued from page 380)

Bids: April 15, 1949 (917)

Switch Bay Addition

TO
WEST WATER STREET POWER PLANT
ADVERTISEMENT FOR PROPOSALS
TAUNTON MUNICIPAL LIGHTING PLANT
TAUNTON, MASSACHUSETTS

Sealed bids for constructing "Superstructure, Building Services and Miscellaneous Electric Work" for an addition approximately 30 ft. by 90 ft. by 35 ft. high on the West Water Street Power Plant for a new switch bay and office facilities will be received by the Manager at his office in the Taunton Municipal Lighting Plant Building until 11:00 A. M. Eastern Standard Time Friday, April 15, 1949. The Contract Documents, including Specifications and Drawings, may be examined at the office of the Taunton Municipal Lighting Plant, Taunton, Massachusetts, and at the office of Jackson & Moreland, Engineers, 31 St. James Avenue, Boston, Massachusetts on and after February 25, 1949, every weekday except Saturdays between the hours of 9:00 A. M. and 4:00 P. M. and copies thereof may be obtained upon deposit of $30.00 for each set. If all the documents and drawings are returned in good condition, within five days after the opening of bids, the entire amount of deposit will be returned to the bidder.

Each bid must be accompanied by a certified check, for 5 per cent of the bid price, as bid security. No bid may be withdrawn within thirty calendar days after the date of opening thereof. Certified check will be returned to unsuccessful bidders at the expiration of the thirty-day period and to the successful bidder upon delivery of the performance bond.

A performance bond in an amount equal to 100 per cent of the contract price will be required. The right is reserved to waive any informalities in or to reject any or all bids, and to award the contract to any one of the contractors bidding on the work whose bid is deemed to be in the best interest of the Taunton Municipal Lighting Plant.

TAUNTON MUNICIPAL LIGHTING PLANT
BY C. A. OLIVER, MANAGER

OFFICIAL PROPOSALS

Bids: March 29, 1949 (904)

County Road Work

DELAWARE COUNTY HIGHWAY DEPARTMENT
Delhi, New York

Pursuant to the provisions of Article 6, Section 126, of the Highway Law, sealed proposals will be received by the County Superintendent of Highways, at the Delaware County Highway Office, Page Avenue, Delhi, New York, until two o'clock Eastern Standard Time, on Tuesday, March 29, 1949, for the construction of the following:

CONTRACT NO. 1 — Dunraven-New Kingston County Road, Project No. 46, 0.10 miles variable width of roadway. Bridge #6-1, superstructure abutments and approaches, grading and foundation course. Department Estimate, $52,990.00. Deposit required, $3,000.00.

Structural and reinforcing steel will be furnished by the County of Delaware without charge to the contractor, delivered at the bridge site. Quality and type of materials to be furnished will be tabulated on the contract drawings.

Minimum Wage Rate per hour for above work shall be as follows:
Labor $1.00

CONTRACT NO. 2 — East Masonville-Sidney Center County Road, Project No. 48, 0.02 miles. Bridge 35-1, superstructure, abutments and approaches, grading and foundation course. Department estimate, $15,514.00. Deposit required, $1,000.00.

Minimum Wage Rate per hour for above work shall be as follows:
Labor $1.30

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the County Superintendent of Highways, at Delhi, New York. Plans will be made for plans, specifications or for each set, or check payable to Delaware County Highway Department. No refund will be made for plans, specifications or proposal forms.

Special attention of bidders is called to General Information for Bidders in the proposal, specifications, and contract agreement. Proposals for each highway or contract must be submitted in a separate sealed envelope with the name and number of the project plainly endorsed on the outside of the envelope.

OFFICIAL PROPOSALS

Each proposal must be accompanied by cash, draft, or certified check, payable to the County Treasurer of the County of Delaware, for the sum as specified in the advertisement for proposals and the proposal itself for each project. The retention and disposal of such cash, draft or check by the County of Delaware shall conform with sub-division 2, Section 38, of the Highway Law, as amended. The successful bidder will be required to execute the contract and comply in all respects with Section 38 of the Highway Law as amended.

The right is reserved to reject any or all bids.

Malcolm MacPherson
County Superintendent of Highways

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Boise, Idaho, March 7, 1949. Sealed bids (Specifications No. R1-40) will be received at the office of the Bureau of Reclamation, Idaho Falls, Idaho, until 10 a.m., April 19, 1949, and will at that hour be opened, for furnishing labor and materials and performing all work for the construction of the Goshen to Palisades 115 and 44-kv transmission line, Palisades Project, Idaho. The line is to be approximately 52 miles long. Time allowed for completion will be 450 days. For particulars address Bureau of Reclamation, Idaho Falls, Idaho; Box 937, Boise, Idaho; Bldg. 1a, Denver Federal Center, Denver, Colorado; or Washington 25, D. C.

MICHAEL W. STRAUS, Commissioner.
(923)

UNITED STATES DEPARTMENT OF THE INTERIOR. Bureau of Reclamation. Sealed bids (Specifications No. 2587) will be received by Bureau of Reclamation, Elverta, California. until 10 a.m., April 1, 1949, and then publicly opened for furnishing labor and performing all work for constructing approximately 8.85 miles of additional wood-pole line for the 230-kv Shasta-Tracy transmission line No. 1, Central Valley Project, California. The Government furnishes materials. Time allowed for completion will be 120 days. For particulars, address the Bureau of Reclamation, Elverta, California; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(922)

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E. Lansing, Michigan

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Collingswood, N. J.

Stadium, Tiffin, Ohio

Allentown School Stadium
Allentown, Pa.

Hershey Stadium
Hershey, Pa.

University of Texas Stadium
Austin, Texas

Cotton Bowl, Dallas, Texas

Stadium and Bull Ring
Sports City, Mexico

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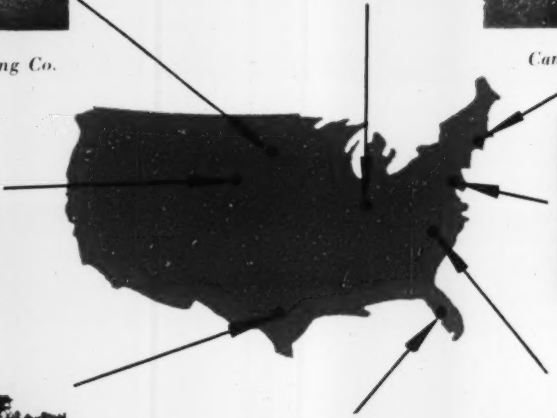

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